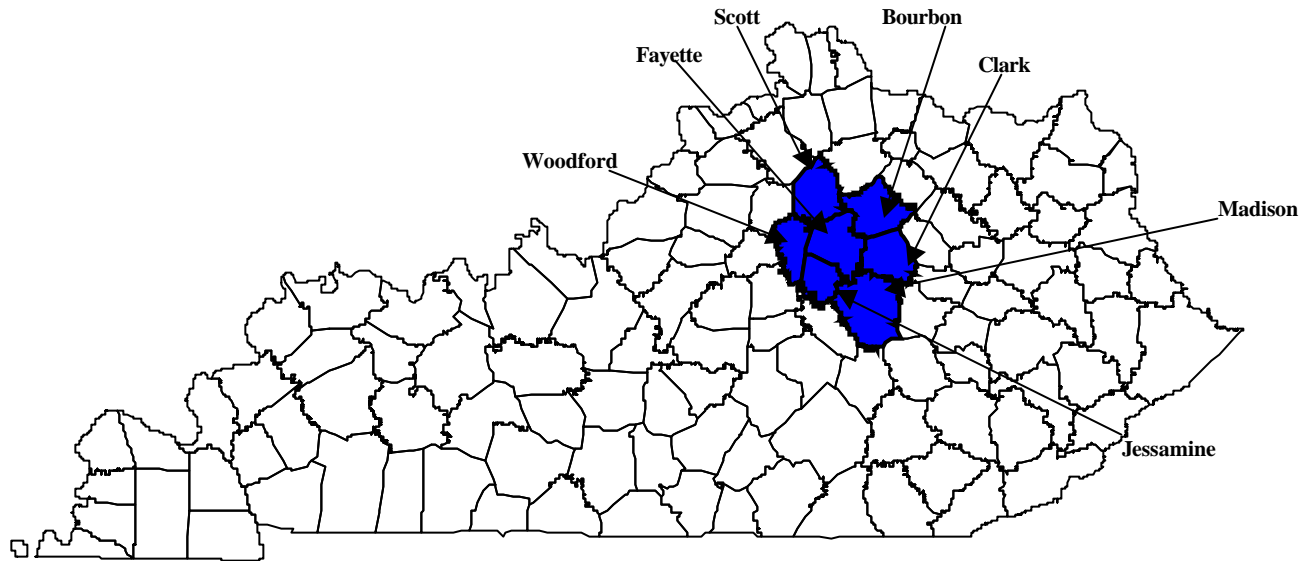


# Lexington, Kentucky MSA



The Lexington, Kentucky Metropolitan Statistical Area (MSA) encompasses Fayette, Bourbon, Clark, Jessamine, Madison, Scott, and Woodford Counties in Kentucky. In 2001, the MSA was listed as being the 86<sup>th</sup> largest within the United States.

## **FAYETTE COUNTY, KENTUCKY**

Fayette County is located in the Lexington, Kentucky Metropolitan Statistical Area (MSA) and is located to the east of Woodford County, to the northeast of Jessamine County, to the northwest of Madison County, to the west of Clark County, to the southeast of Scott County, and to the southwest of Bourbon County.

### **Geography/Topography**

Fayette County has a land area of 284 square miles and is located in the heart of central Kentucky's Bluegrass Region. Lexington is the state's second largest urban area. The urbanized area is surrounded by a scenic countryside of world famous horse farms and gently rolling terrain. Interstate 75, a major north-south corridor, and Interstate 64, a major east-west route, intersect north and east of downtown Lexington.

### **Meteorological Information**

Wind speed/wind direction information shows that the majority of the time for the period 1988-1992, the wind in the Fayette County area came from the southwest and typically from 7-10 knots. (See figure 1-A) The mean high temperature for July for the area from 1961 through 1990 was 86°F and the mean low was 66°F. The mean precipitation for the same period was 4.8 inches.

### **Planning**

The authority for air quality planning in the Fayette County area resides with the Kentucky Environmental and Public Protection Cabinet. Transportation planning for all of Fayette County is performed by the Lexington Area Metropolitan Planning Organization (LAMPO).

### **Air Monitoring**

For the 2001 - 2003 monitoring period, the PM<sub>2.5</sub> monitor (21-067-0014) at South Limestone in Fayette County, Kentucky, shows an annual average design value of 15.6 micrograms per cubic meter, which exceeds the PM<sub>2.5</sub> annual National Ambient Air Quality Standard (NAAQS) and would be classified as a county in nonattainment. There is an additional PM<sub>2.5</sub> monitor (21-067-0012) at Newtown Pike in Fayette County, Kentucky, which shows an annual average design value of 14.9 micrograms per cubic meter, which is in attainment of the standard. The monitoring information for 2003 is complete for all counties in the Lexington MSA. (See table 1-A)

## **Population**

Based on projections to 2002 from the 2000 census data, there are 263,618 persons living in Fayette County. (See table 1-C) That represents approximately 928 persons per square mile. The population of Fayette County is approximately 4% rural with the remaining 96% living in incorporated areas. The largest city in Fayette County is Lexington.

Fayette County's population from 1990 through 2000 increased by approximately 15.6% (225,366 to 260,512). The population is further expected to increase by an additional 13.5% between 2000 and 2010. (See table 1-B)

Based on 2002 population data for the Lexington MSA, Fayette County represents approximately 53.8% of the total 2002 population in the MSA area. (See table 1-C)

## **Air Emissions**

The emissions presented in this document are from the U.S. EPA's 1999 National Emission Inventory (NEI). In addition, the PM<sub>2.5</sub> emissions provided in this document are for primary PM<sub>2.5</sub> from the 1999 NEI. Primary PM<sub>2.5</sub>, is directly emitted from a stack or an open source and includes filterable and condensable particles.

## **Point Sources**

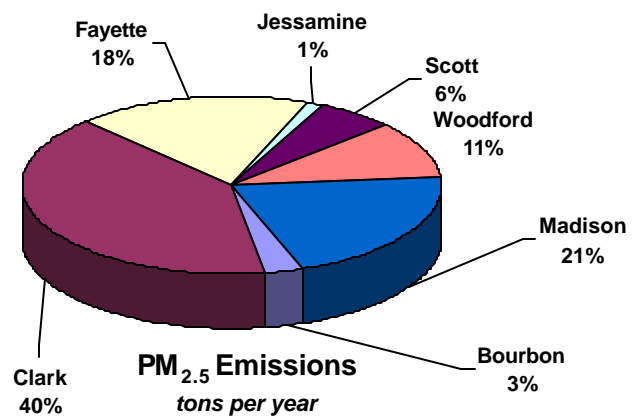
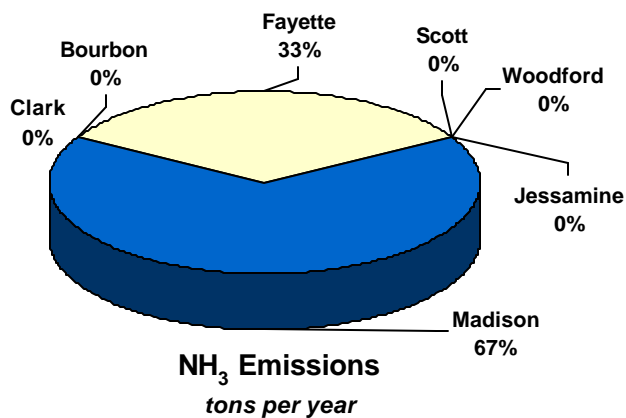
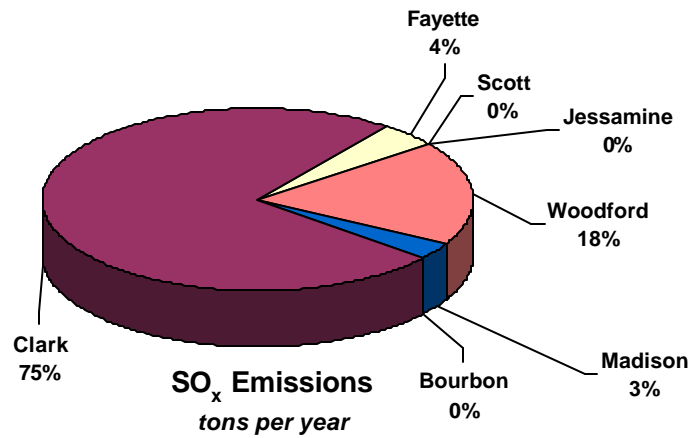
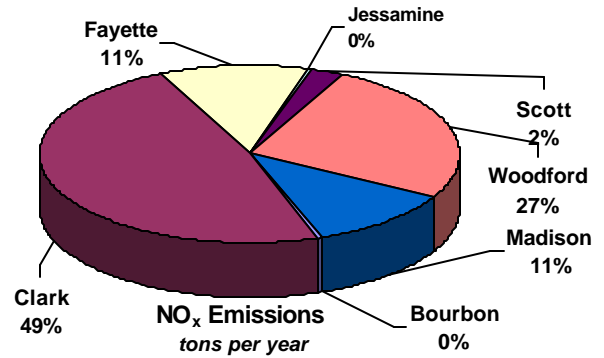
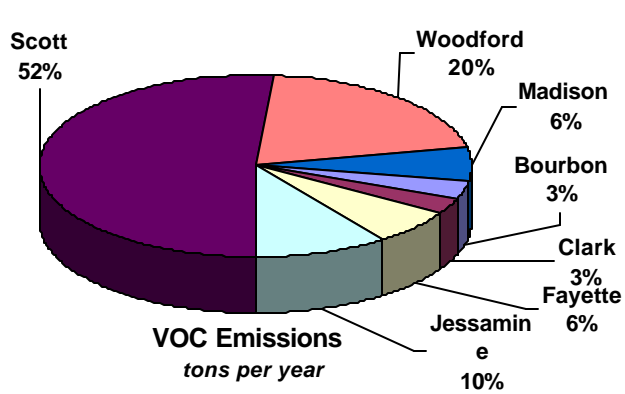
Point source VOC emissions from Fayette County were estimated at 431 tons per year in 1999, which represents approximately 6% of the total 6,719 tpy overall VOC point source emissions from the Lexington MSA. Point source NO<sub>x</sub> emissions from Fayette County were estimated at 875 tpy in 1999, which represents 11% of the total 7,641 tpy overall NO<sub>x</sub> point source emissions from the Lexington MSA. (See table 1-D)

Point source SO<sub>x</sub> emissions from Fayette County were estimated at 541 tons per year in 1999, which represents approximately 4% of the total 12,210 tpy overall SO<sub>x</sub> point source emissions from the Lexington MSA. (See table 1-E)

Point source NH<sub>3</sub> emissions from Fayette County were estimated at 1 tpy in 1999, which represents 33.3% of the total 3 tpy overall NH<sub>3</sub> point source emissions from the Lexington MSA. (See table 1-F)

Point source PM<sub>2.5</sub> emissions from Fayette County were estimated at 104 tons per year in 1999, which represents approximately 18% of the total 582 tpy overall PM<sub>2.5</sub> point source emissions from the Lexington MSA. (See table 1-G)

# 1999 NEI Lexington MSA Point Source Emissions (tons per year)



Point sources located within Fayette County are subject to PSD requirements, CTG RACT requirements, Maximum Achievable Control Technology (MACT) requirements for sources of Hazardous Air Pollutants, and New Source Performance Standards (NSPS).

### Onroad Mobile

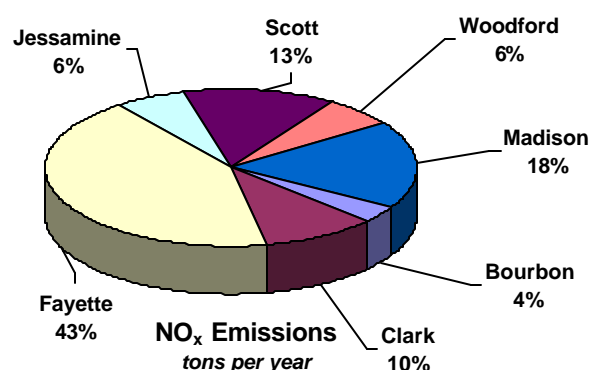
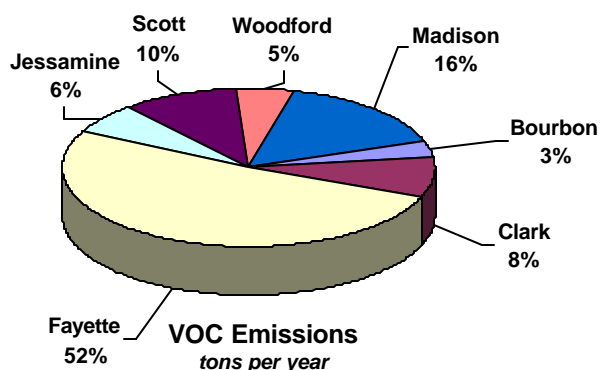
Onroad mobile source VOC emissions from Fayette County were estimated at 6,549 tons per year in 1999, which represents approximately 52% of the total 12,736 tpy of overall VOC onroad mobile source emissions from the Lexington MSA. Onroad mobile source NO<sub>x</sub> emissions from Fayette County were estimated at 7,769 tpy in 1999, which represents approximately 43% of the total 18,194 tpy of overall NO<sub>x</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-D)

Onroad mobile source SO<sub>x</sub> emissions from Fayette County were estimated at 302 tons per year in 1999, which represents approximately 46% of the total 675 tpy overall SO<sub>x</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-E)

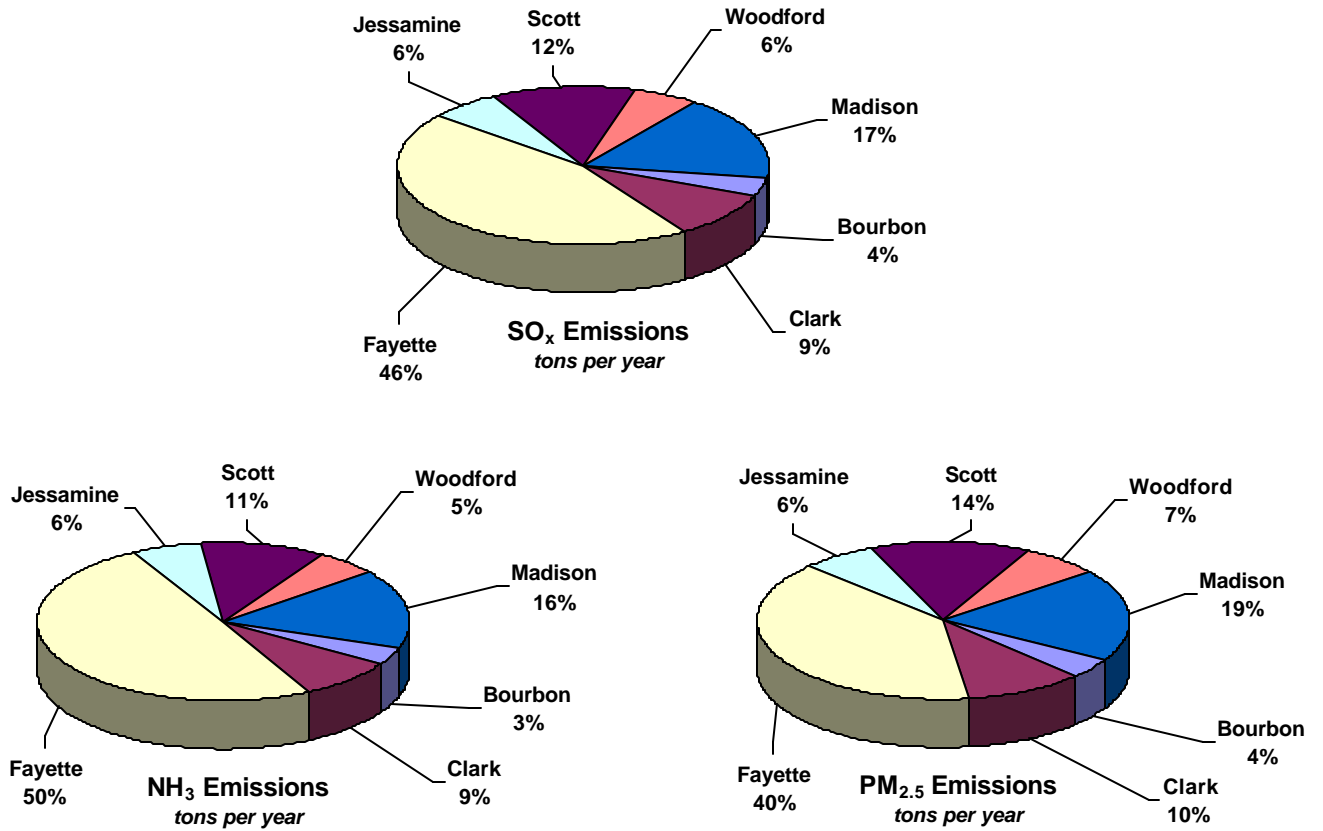
Onroad mobile source NH<sub>3</sub> emissions from Fayette County were estimated at 278 tpy in 1999, which represents approximately 50% of the total 564 tpy overall NH<sub>3</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-F)

Onroad mobile source PM<sub>2.5</sub> emissions from Fayette County were estimated at 153 tons per year (tpy) in 1999, which represents approximately 40% of the total 388 tpy overall PM<sub>2.5</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-G)

### 1999 NEI Lexington MSA Onroad Mobile Source Emissions (tons per year)



# **1999 NEI Lexington MSA Onroad Mobile Source Emissions (continued)**



Based on information received from the Kentucky Transportation Cabinet, commuting traffic from other counties into Fayette County is 29.6% and classified as minimal, and the commuting traffic from Fayette County into other counties is minimal at 14.0%.

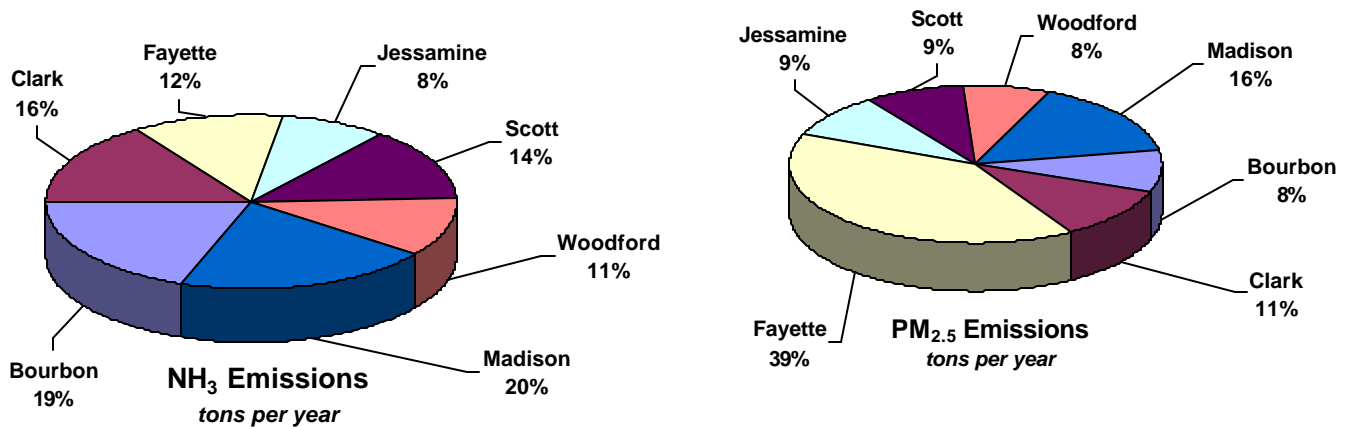
Commuting Classifications	
Not Significant	0-10%
Minimal	11-30%
High	31-50%
Significant	51% or more

## Area Sources

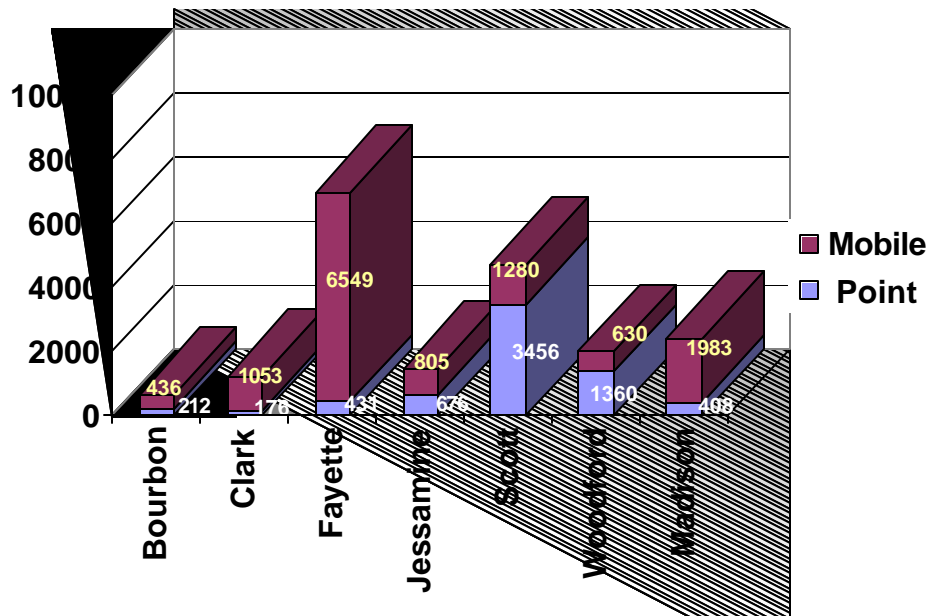
Area source  $\text{NH}_3$  emissions from Fayette County were estimated at 994 tpy in 1999, which represents approximately 12% of the total 8,281 tpy of overall  $\text{NH}_3$  area source emissions from the Lexington MSA. (See table 1-F)

Area source  $\text{PM}_{2.5}$  emissions from Fayette County were estimated at 2,390 tpy in 1999, which represents approximately 39% of the total 6,009 tpy of overall  $\text{PM}_{2.5}$  area source emissions from the Lexington MSA. (See table 1-G)

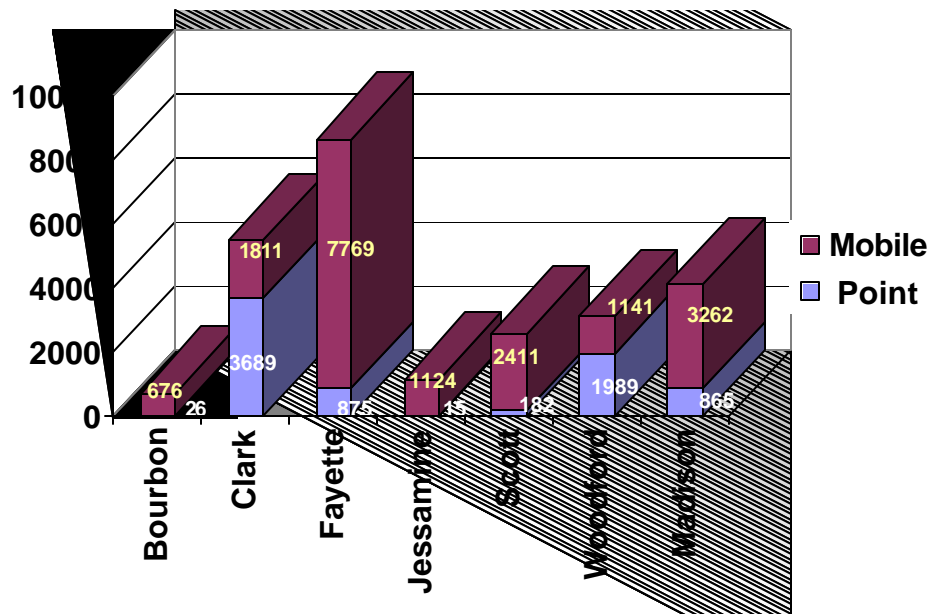
### 1999 NEI Lexington MSA Area Source Emissions (tons per year)



# 1999 NEI VOC Contribution (tons per year)

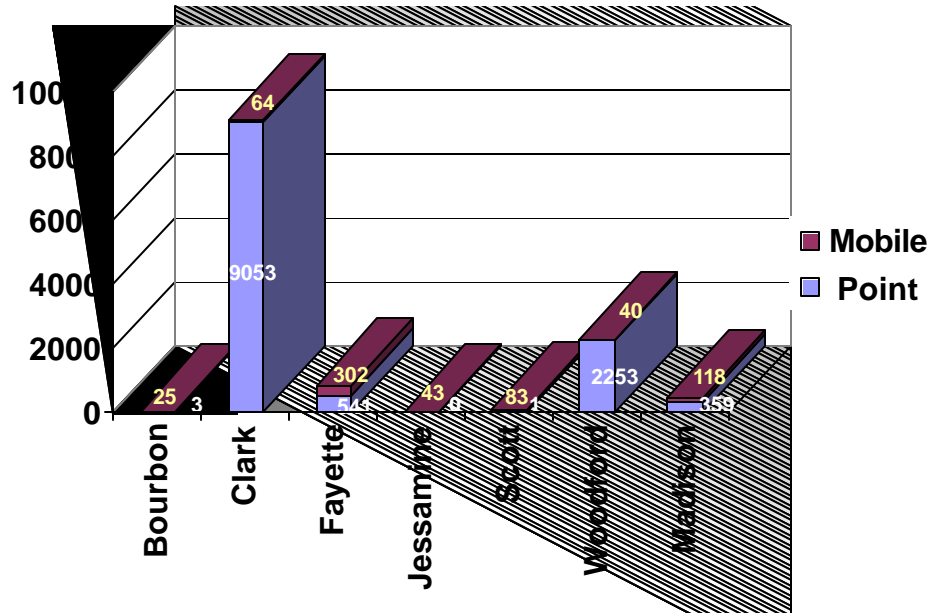


# 1999 NEI NO<sub>x</sub> Contribution (tons per year)

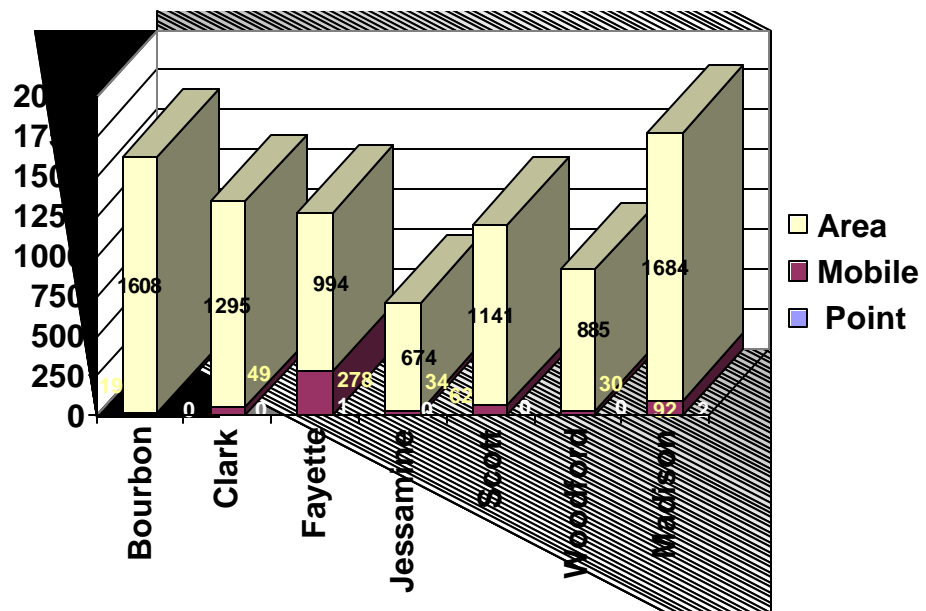




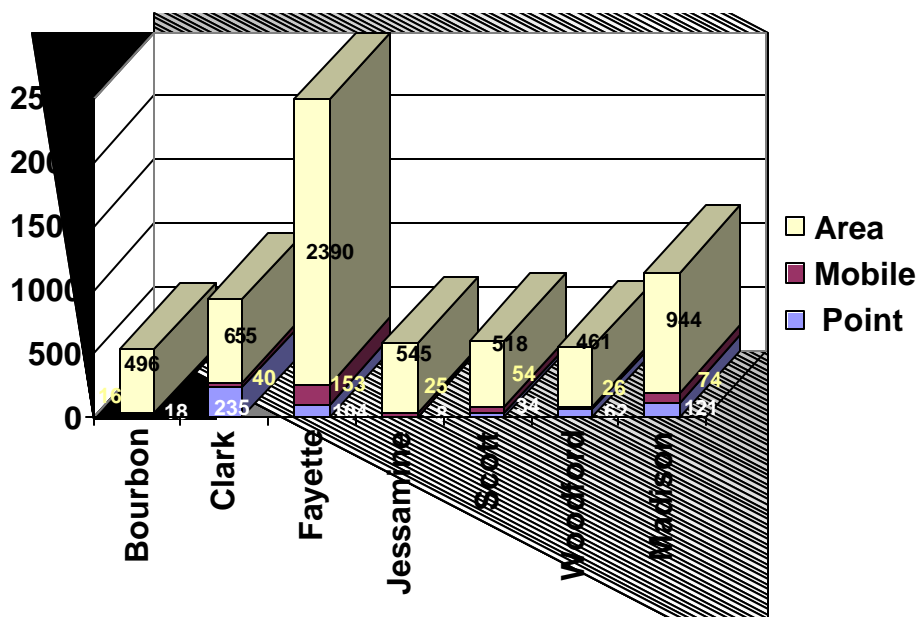
**1999 NEI SO<sub>x</sub>  
Contribution  
(tons per year)**



**1999 NEI NH<sub>3</sub>  
Contribution  
(tons per year)**



## 1999 NEI PM<sub>2.5</sub> Contribution (tons per year)



### Conclusion and Recommendation

Fayette County, based on 2001 - 2003 PM<sub>2.5</sub> monitoring data, is not meeting the annual PM<sub>2.5</sub> standard with annual design value of 15.6 micrograms per cubic meter at the Limestone monitoring location. However, it is important to note that the Newtown Pike monitoring station is showing attainment and that both monitoring locations within Fayette County continue to show declining yearly average values. The other monitor in the MSA, located in Madison County, is also showing improvements in air quality and is meeting the standard with a design value of 13.4 micrograms per cubic meter.

Additionally, final compliance with the NO<sub>x</sub> SIP Call is mandated by May 2004, with additional regional reductions such as the recently proposed interstate transport rule on the horizon.

The above documentation is important in determining the overall impact this standard will have on the region. However, based on the monitoring data presented at the Limestone location, Fayette County should be designated nonattainment for the PM<sub>2.5</sub> standard.

## **BOURBON COUNTY, KENTUCKY**

Bourbon County is part of the Lexington-Fayette County, Kentucky Metropolitan Statistical Area (MSA). It is located southeast of Harrison County, southwest of Nicholas County, east of Scott County, west of Bath County, northwest of Montgomery County, northeast of Fayette County, and directly north of Clark County.

### **Geography/Topography**

Bourbon County has a land area of 291 square miles and is located in the heart of central Kentucky's Bluegrass Region, an area famous for its many beautiful horse farms and gently-rolling topography.

### **Meteorological Information**

Wind speed/wind direction information shows that the majority of the time for the period 1988-1992, the wind in the Bourbon County area came from the southwest and typically from 7-10 knots. (See figure 1-A) The mean high temperature for July for the area from 1961 through 1990 was 86°F and the mean low was 66°F. The mean precipitation for the same period was 4.8 inches.

### **Planning**

The authority for air quality planning in the Bourbon County area resides with the Kentucky Environmental and Public Protection Cabinet. Transportation planning for all of Bourbon County is performed by the Kentucky Transportation Cabinet.

### **Air Monitoring**

For the 2001 - 2003 monitoring period, there were no PM<sub>2.5</sub> monitors located in Bourbon County. However, because the PM<sub>2.5</sub> monitor (21-067-0014) at South Limestone in Fayette County, Kentucky, shows an annual average design value of 15.6 micrograms per cubic meter, which exceeds the PM<sub>2.5</sub> annual National Ambient Air Quality Standard (NAAQS) and would be classified as a county in nonattainment, information for Bourbon County is being presented in this document. The PM<sub>2.5</sub> monitor (21-067-0012) at Newtown Pike in Fayette County, Kentucky, shows an annual average design value of 14.9 micrograms

per cubic meter, which is in attainment of the standard. The monitoring information for 2003 is complete for all counties in the Lexington MSA. (See table 1-A)

## **Population**

Based on projections to 2002 from the 2000 census data, there are 19,576 persons living in Bourbon County. (See table 1-C) That represents approximately 67 persons per square mile. The population of Bourbon County is approximately 45.2% rural with the remaining 54.9% living in incorporated areas. The largest city in Bourbon County is Paris.

Bourbon County's population from 1990 through 2000 increased by approximately 0.6% (19,236 to 19,360). The population is expected to decrease by approximately -0.1% between 2000 and 2010. (See table 1-B)

Based on 2002 population data for the Lexington MSA, Bourbon County represents approximately 4.0% of the total 2002 population in the MSA area. (See table 1-C)

## **Air Emissions**

The emissions presented in this document are from the U.S. EPA's 1999 National Emission Inventory (NEI). In addition, the PM<sub>2.5</sub> emissions provided in this document are for primary PM<sub>2.5</sub> from the 1999 NEI. Primary PM<sub>2.5</sub>, is directly emitted from a stack or an open source and includes filterable and condensable particles.

## **Point Sources**

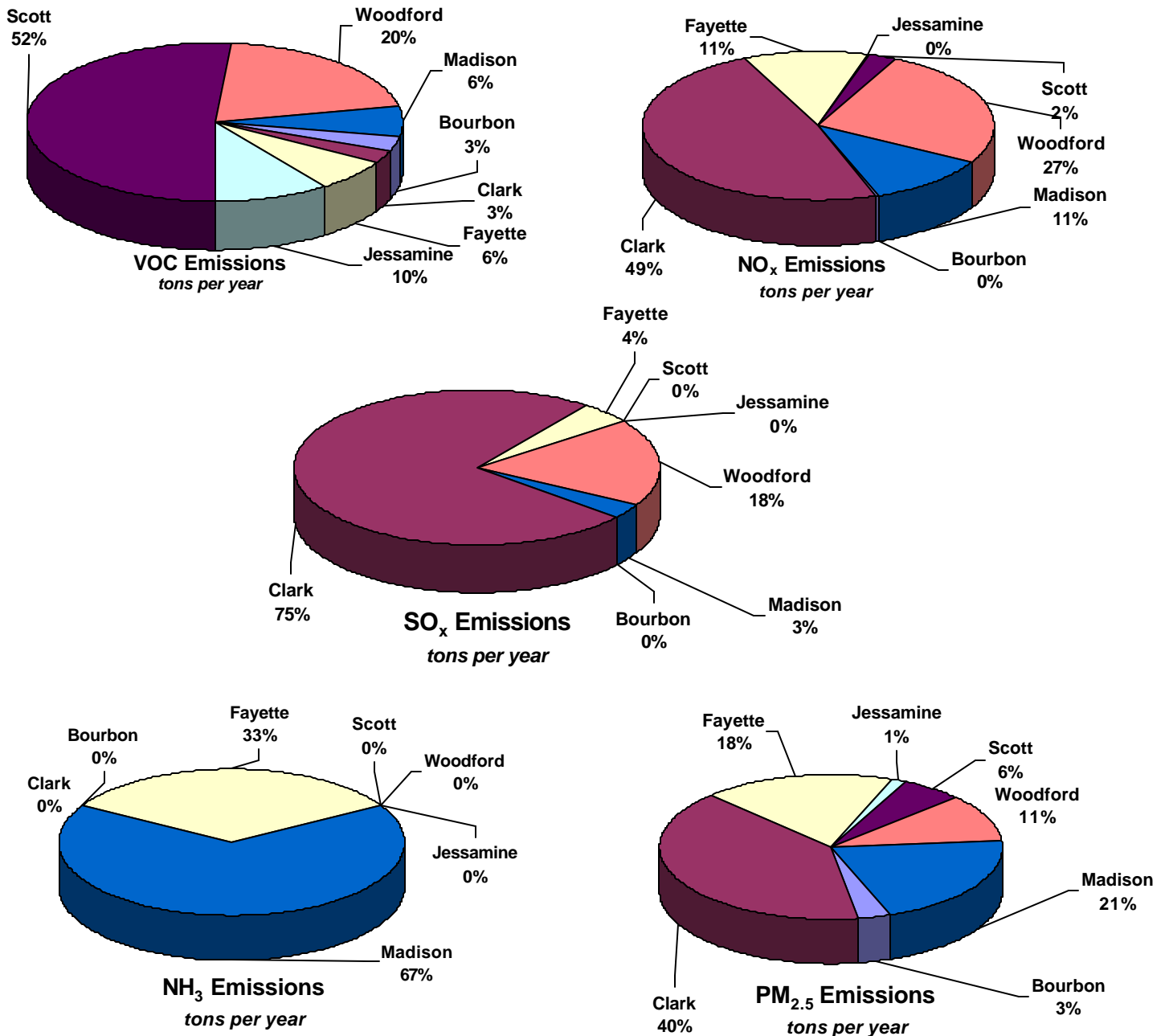
Point source VOC emissions from Bourbon County were estimated at 212 tons per year (tpy) in 1999, which represents approximately 3% of the total 6,719 tpy overall VOC point source emissions from the Lexington MSA. Point source NO<sub>x</sub> emissions from Bourbon County were estimated at 26 tpy in 1999, which represents less than 1% of the total 7,641 tpy overall NO<sub>x</sub> point source emissions from the Lexington MSA. (See table 1-D)

Point source SO<sub>x</sub> emissions from Bourbon County were estimated at 3 tons per year in 1999, which represents less than 1% of the total 12,210 tpy overall SO<sub>x</sub> point source emissions from the Lexington MSA. (See table 1-E)

Point source NH<sub>3</sub> emissions from Bourbon County were estimated at 0 tpy in 1999. (See table 1-F)

Point source PM<sub>2.5</sub> emissions from Bourbon County were estimated at 18 tons per year (tpy) in 1999, which represents approximately 3% of the total 582 tpy overall PM<sub>2.5</sub> point source emissions from the Lexington MSA. (See table 1-G)

### 1999 NEI Lexington MSA Point Source Emissions (tons per year)



Point sources located within Bourbon County are subject to PSD requirements, CTG RACT requirements, Maximum Achievable Control Technology (MACT) requirements for sources of Hazardous Air Pollutants, and New Source Performance Standards (NSPS).

### Onroad Mobile

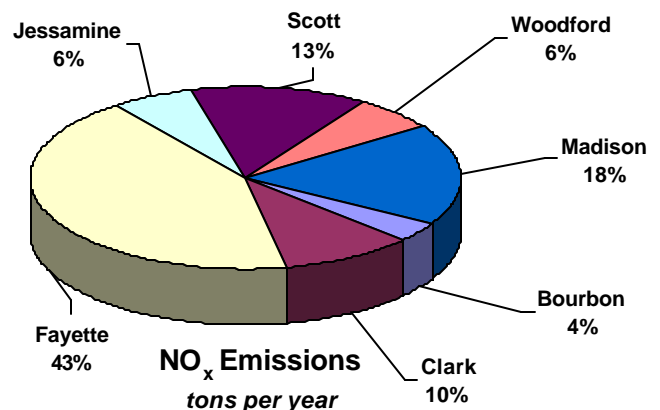
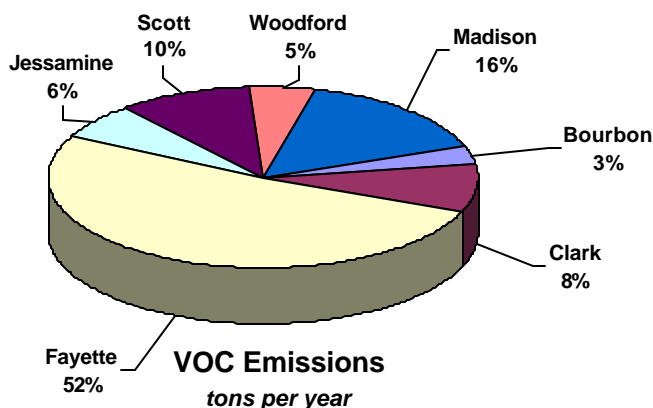
Onroad mobile source VOC emissions from Bourbon County were estimated at 436 tons per year in 1999, which represents approximately 3% of the total 12,736 tpy of overall VOC onroad mobile source emissions from the Lexington MSA. Onroad mobile source NO<sub>x</sub> emissions from Bourbon County were estimated at 676 tpy in 1999, which represents approximately 4% of the total 18,194 tpy of overall NO<sub>x</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-D)

Onroad mobile source SO<sub>x</sub> emissions from Bourbon County were estimated at 25 tons per year in 1999, which represents approximately 4% of the total 675 tpy overall SO<sub>x</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-E)

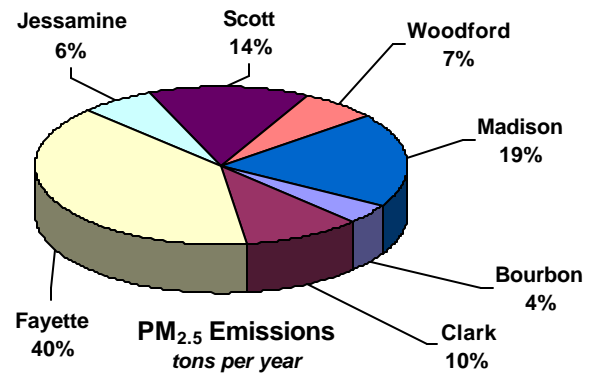
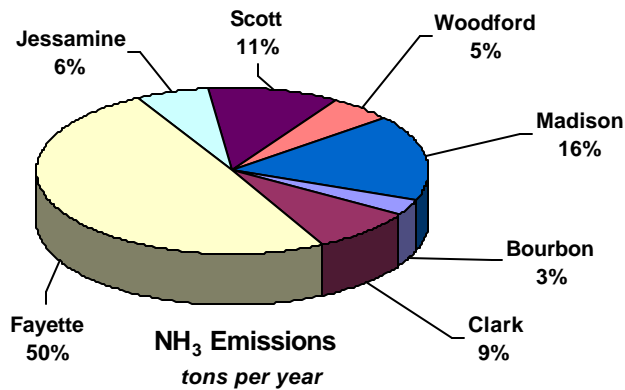
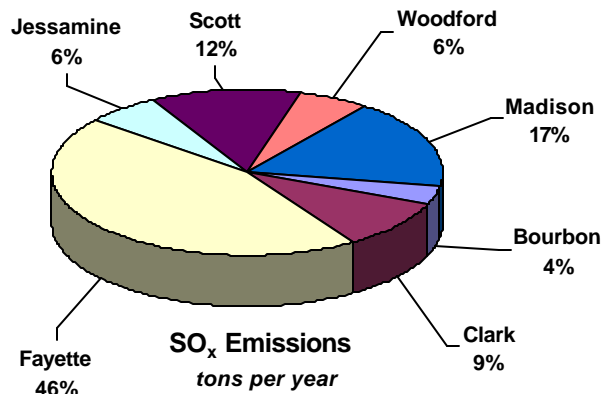
Onroad mobile source NH<sub>3</sub> emissions from Bourbon County were estimated at 19 tpy in 1999, which represents approximately 3% of the total 564 tpy overall NH<sub>3</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-F)

Onroad mobile source PM<sub>2.5</sub> emissions from Bourbon County were estimated at 16 tons per year (tpy) in 1999, which represents approximately 4% of the total 388 tpy overall PM<sub>2.5</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-G)

### 1999 NEI Lexington MSA Onroad Mobile Source Emissions (tons per year)



# **1999 NEI Lexington MSA Onroad Mobile Source Emissions (continued)**



Based on information received from the Kentucky Transportation Cabinet, commuting traffic from other counties into Bourbon County is 35.3% and classified as high, and the commuting traffic from Bourbon County into other counties is high at 47.7%.

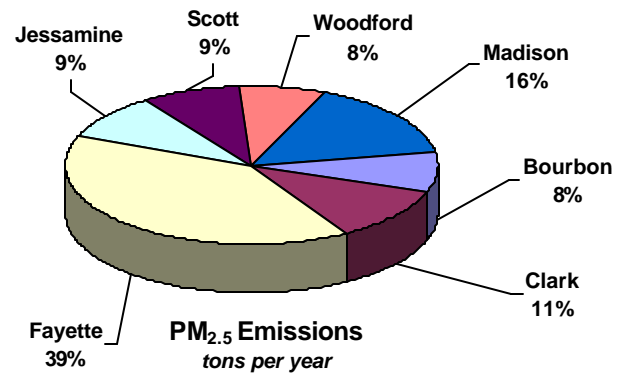
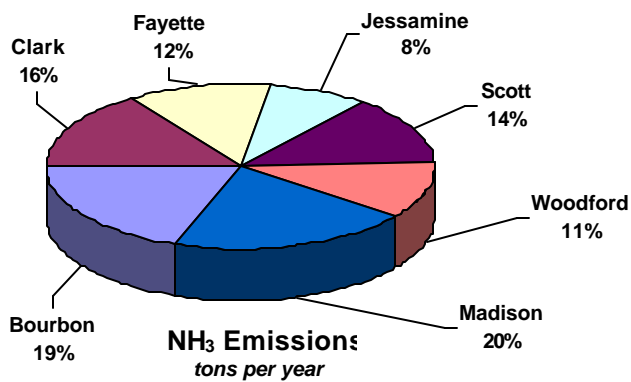
Commuting Classifications	
Not Significant	0-10%
Minimal	11-30%
High	31-50%
Significant	51% or more

## Area Sources

Area source  $\text{NH}_3$  emissions from Bourbon County were estimated at 1,608 tpy in 1999, which represents approximately 19% of the total 8,281 tpy of overall  $\text{NH}_3$  area source emissions from the Lexington MSA. (See table 1-F)

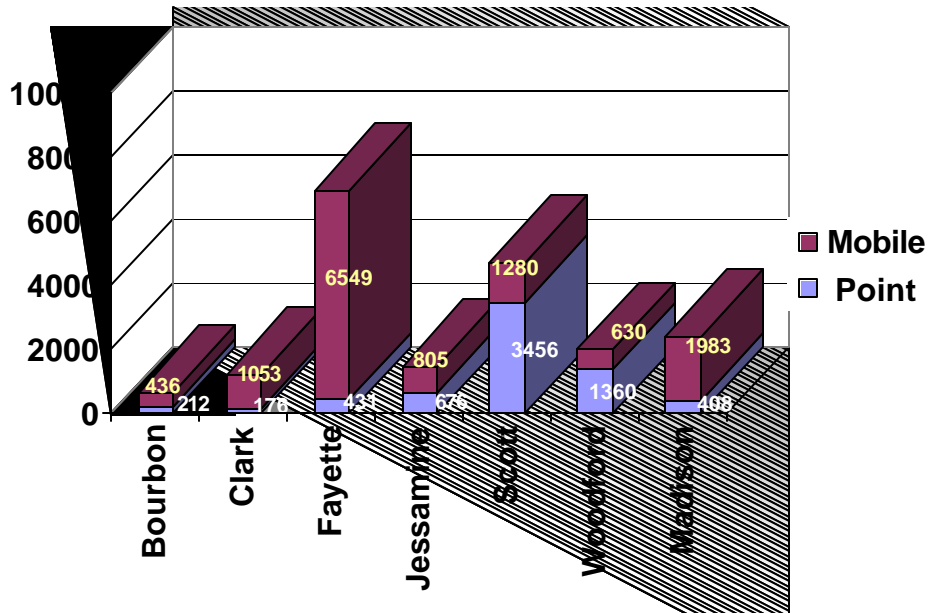
Area source  $\text{PM}_{2.5}$  emissions from Bourbon County were estimated at 496 tpy in 1999, which represents approximately 8% of the total 6,009 tpy of overall  $\text{PM}_{2.5}$  area source emissions from the Lexington MSA. (See table 1-G)

### 1999 NEI Lexington MSA Area Source Emissions (tons per year)

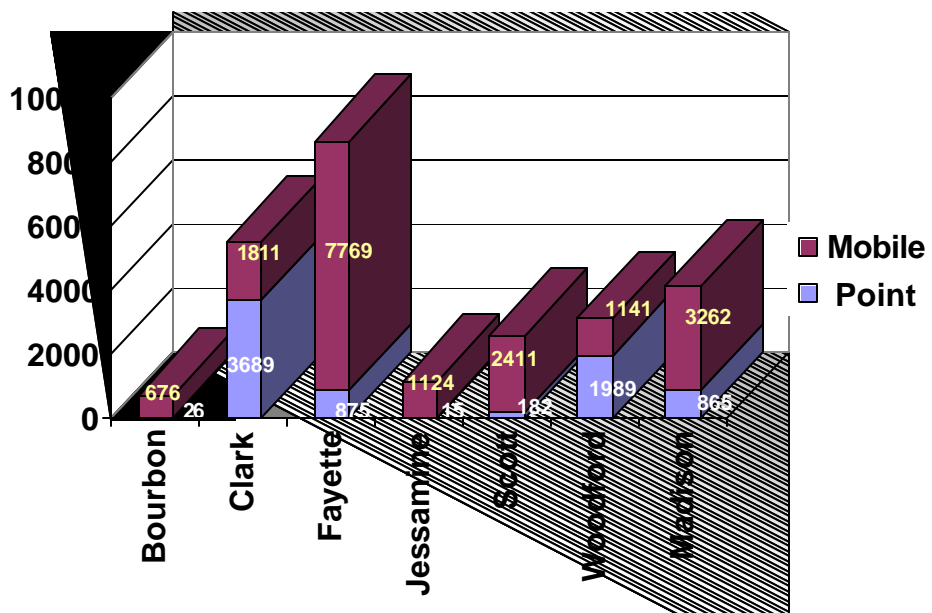




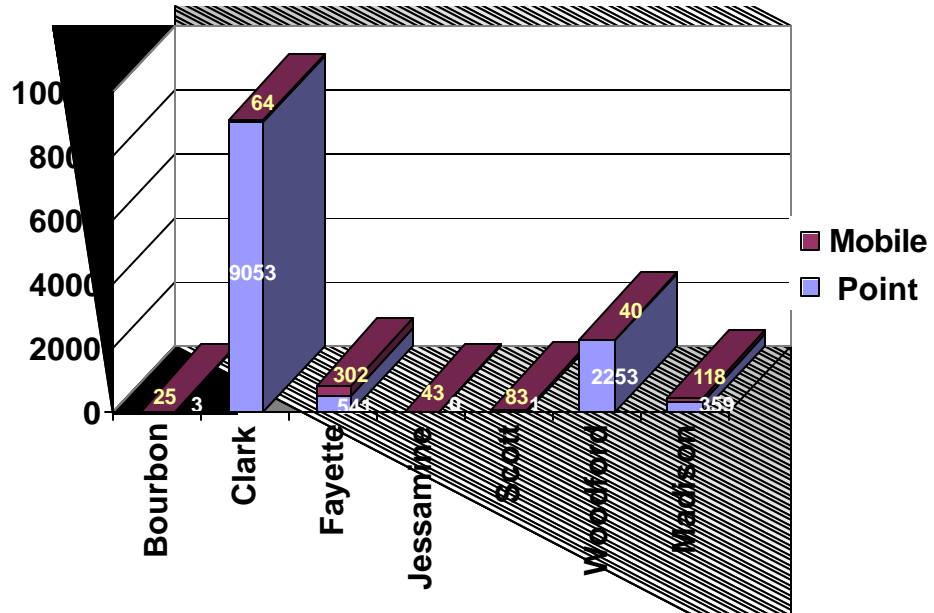
# 1999 NEI VOC Contribution (tons per year)



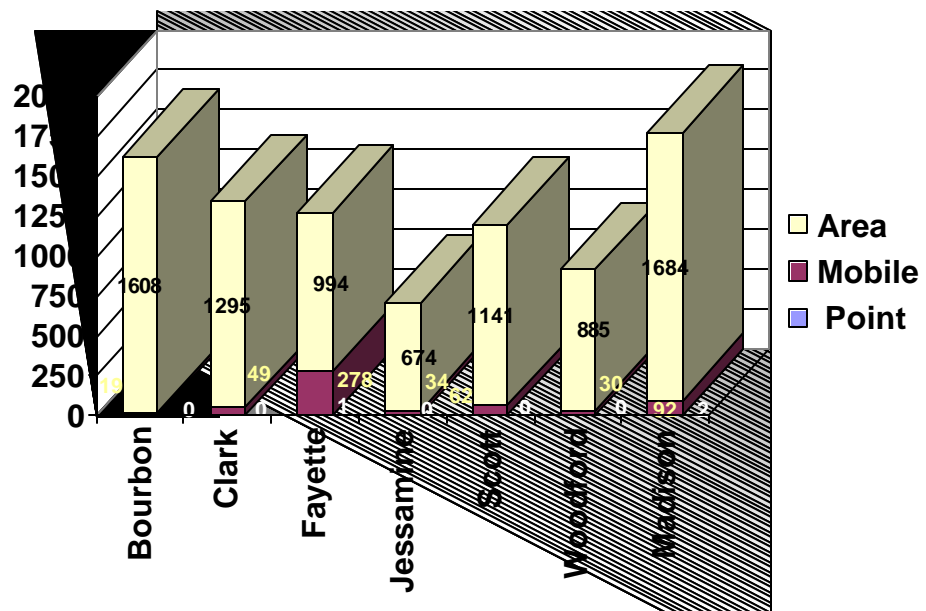
# 1999 NEI NO<sub>x</sub> Contribution (tons per year)



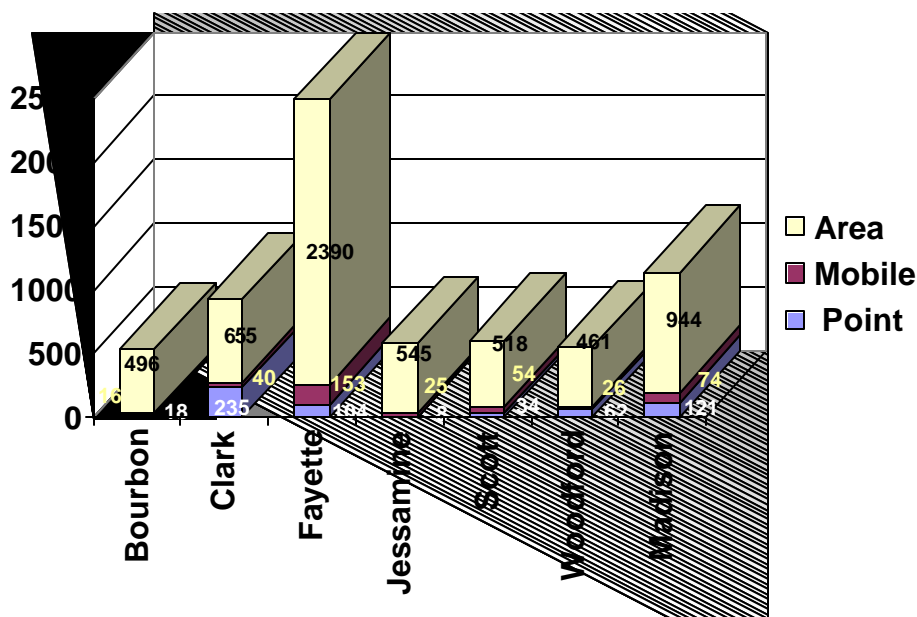
# 1999 NEI SO<sub>x</sub> Contribution (tons per year)



# 1999 NEI NH<sub>3</sub> Contribution (tons per year)



## 1999 NEI PM<sub>2.5</sub> Contribution (tons per year)



### Conclusion and Recommendation

The emissions data and other documentation presented indicate that Bourbon County, Kentucky, does not contribute a significant amount of emissions that contribute to PM<sub>2.5</sub> formation in the Lexington-Fayette MSA.

Bourbon County contributes approximately 3% of the total VOC emissions, 3% of the total NO<sub>x</sub> emissions, less than 1% of the total SO<sub>x</sub> emissions, 8% of the total PM<sub>2.5</sub> emissions and 18% of the total NH<sub>3</sub> emissions in the area. Predominant wind patterns would typically have the small amounts of total emissions from Bourbon County moving away from the violating monitor in Fayette County. (See Figure 1-A)

Therefore, Bourbon County should be designated attainment for the PM<sub>2.5</sub> standard.

## **CLARK COUNTY, KENTUCKY**

Clark County is part of the Lexington-Fayette County, Kentucky Metropolitan Statistical Area (MSA) and is on the I-64 east-west interstate corridor. It is located southwest of Montgomery County, northwest of Powell County, north northwest of Estill County, north of Madison County, east of Fayette County, and south of Bourbon County.

### **Geography/Topography**

Clark County has a land area of 254 square miles and is located in the Blue Grass Region of central Kentucky, an area famous for its many beautiful horse farms and gently-rolling topography.

### **Meteorological Information**

Wind speed/wind direction information shows that the majority of the time for the period 1988-1992, the wind in the Clark County area came from the southwest and typically from 7-10 knots. (See figure 1-A) The mean high temperature for July for the area from 1961 through 1990 was 86°F and the mean low was 66°F. The mean precipitation for the same period was 4.8 inches.

### **Planning**

The authority for air quality planning in the Clark County area resides with the Kentucky Environmental and Public Protection Cabinet. Transportation planning for all of Clark County is performed by the Kentucky Transportation Cabinet.

### **Air Monitoring**

For the 2001 - 2003 monitoring period, there were no PM<sub>2.5</sub> monitors located in Clark County. However, because one of two PM<sub>2.5</sub> monitors located in Fayette County, (21-067-0014) at South Limestone in Fayette County, Kentucky, shows an annual average design value of 15.6 micrograms per cubic meter, which exceeds the PM<sub>2.5</sub> annual National Ambient Air Quality Standard (NAAQS) and would be classified as a county in nonattainment, information for Clark County is being presented in this document. The monitoring information for 2001 - 2003 is complete for all counties in the Lexington MSA. (See table 1-A)

## **Population**

Based on projections to 2002 from the 2000 census data, there are 33,726 persons living in Clark County. (See table 1-C) That represents approximately 133 persons per square mile. The population of Clark County is approximately 33.4% rural with the remaining 66.6% living in incorporated areas. The largest city in Clark County is Winchester.

Clark County's population from 1990 through 2000 increased by approximately 12.4% (29,496 to 33,144). The population is expected to further increase by approximately 11.4% between 2000 and 2010. (See table 1-B)

Based on 2002 population data for the Lexington MSA, Clark County represents approximately 6.9% of the total 2002 population in the MSA area. (See table 1-C)

## **Air Emissions**

The emissions presented in this document are from the U.S. EPA's 1999 National Emission Inventory (NEI). In addition, the PM<sub>2.5</sub> emissions provided in this document are for primary PM<sub>2.5</sub> from the 1999 NEI. Primary PM<sub>2.5</sub> is directly emitted from a stack or an open source and includes filterable and condensable particles.

## **Point Sources**

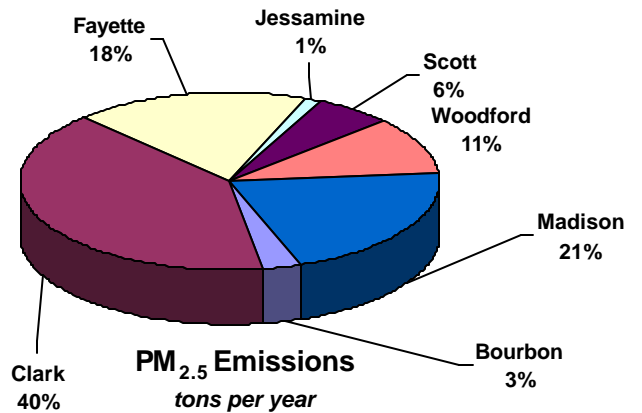
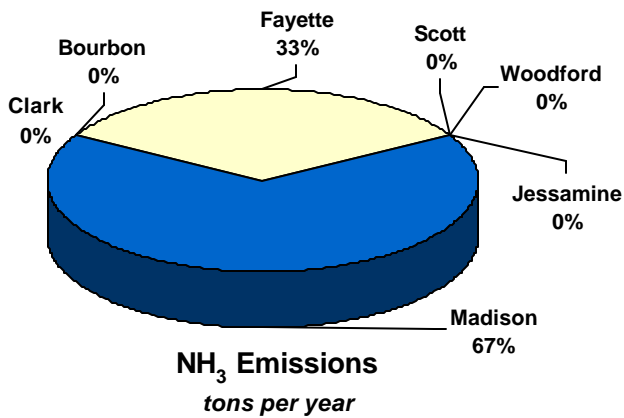
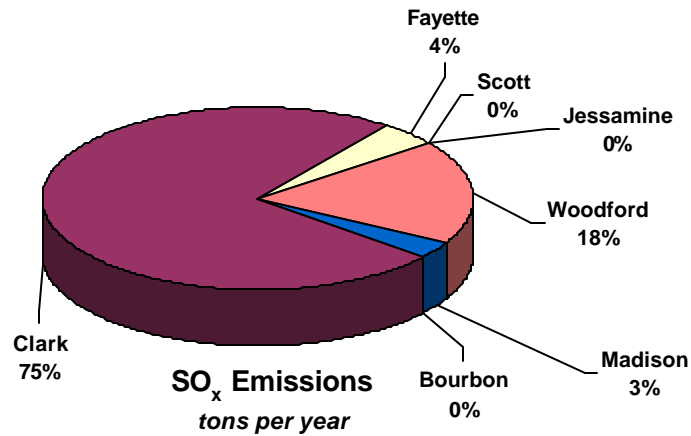
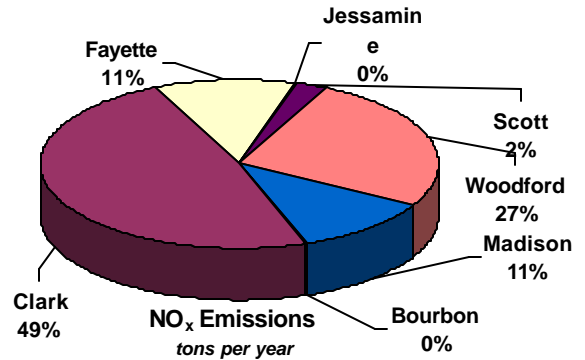
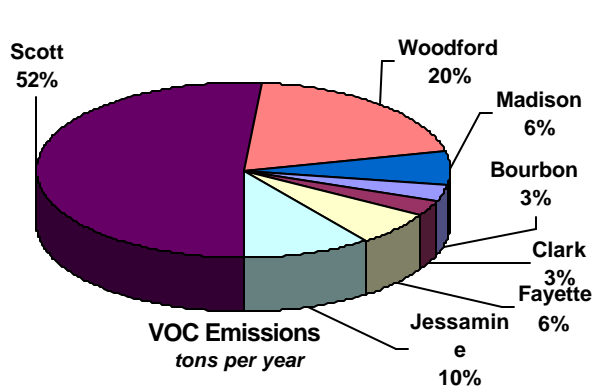
Point source VOC emissions from Clark County were estimated at 176 tons per year (tpy) in 1999, which represents approximately 3% of the total 6,719 tpy overall VOC point source emissions from the Lexington MSA. Point source NO<sub>x</sub> emissions from Clark County were estimated at 3,689 tpy in 1999, which represents approximately 49% of the total 7,641 tpy overall NO<sub>x</sub> point source emissions from the Lexington MSA. (See table 1-D)

Point source SO<sub>x</sub> emissions from Clark County were estimated at 9,053 tons per year in 1999, which represents approximately 75% of the total 12,210 tpy overall SO<sub>x</sub> point source emissions from the Lexington MSA. (See table 1-E)

Point source NH<sub>3</sub> emissions from Clark County were estimated at 0 tpy in 1999. (See table 1-F)

Point source PM<sub>2.5</sub> emissions from Clark County were estimated at 235 tons per year in 1999, which represents approximately 40% of the total 582 tpy overall PM<sub>2.5</sub> point source emissions from the Lexington MSA. (See table 1-G)

# 1999 NEI Lexington Area Point Source Emissions (tons per year)



Point sources located within Clark County are subject to PSD requirements, CTG RACT requirements, Maximum Achievable Control Technology (MACT) requirements for sources of Hazardous Air Pollutants, and New Source Performance Standards (NSPS).

### Onroad Mobile

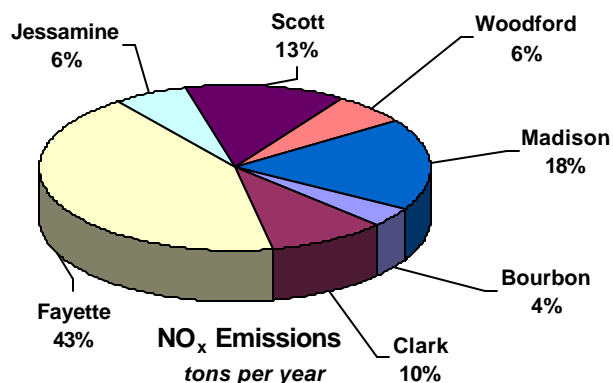
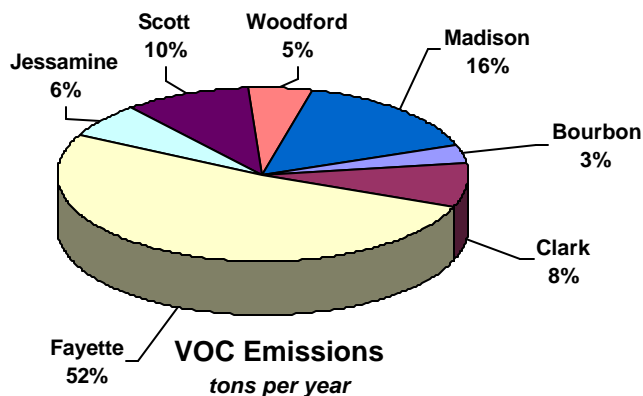
Onroad mobile source VOC emissions from Clark County were estimated at 1,053 tons per year (tpy) in 1999, which represents approximately 8% of the total 12,736 tpy of overall VOC onroad mobile source emissions from the Lexington MSA. Onroad mobile source NO<sub>x</sub> emissions from Clark County were estimated at 1,811 tpy in 1999, which represents approximately 10% of the total 18,194 tpy of overall NO<sub>x</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-D)

Onroad mobile source SO<sub>x</sub> emissions from Clark County were estimated at 64 tons per year (tpy) in 1999, which represents approximately 9% of the total 675 tpy overall SO<sub>x</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-E)

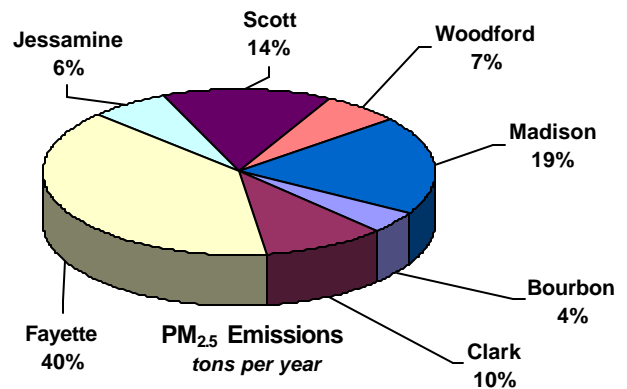
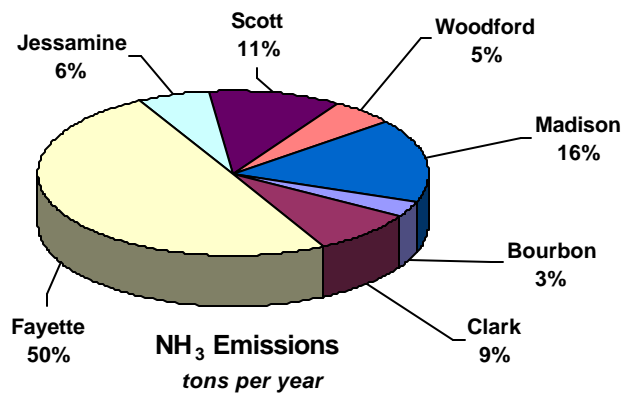
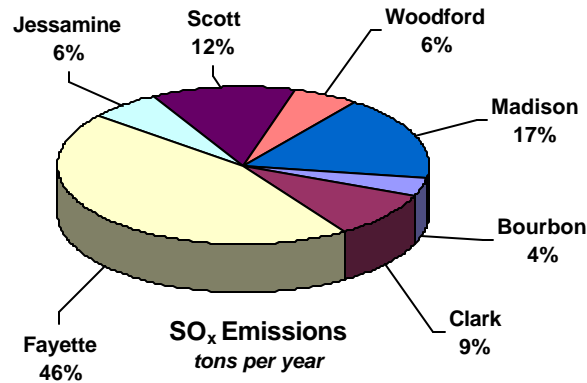
Onroad mobile source NH<sub>3</sub> emissions from Clark County were estimated at 49 tpy in 1999, which represents approximately 9% of the total 564 tpy overall NH<sub>3</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-F)

Onroad mobile source PM<sub>2.5</sub> emissions from Clark County were estimated at 40 tons per year (tpy) in 1999, which represents approximately 10% of the total 388 tpy overall PM<sub>2.5</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-G)

### 1999 NEI Lexington MSA Onroad Mobile Source Emissions (tons per year)



# **1999 NEI Lexington MSA Onroad Mobile Source Emissions** (continued)



Based on information received from the Kentucky Transportation Cabinet, commuting traffic from other counties into Clark County is 40.6% and classified as high, and the commuting traffic from Clark County into other counties is high at 45.2%.

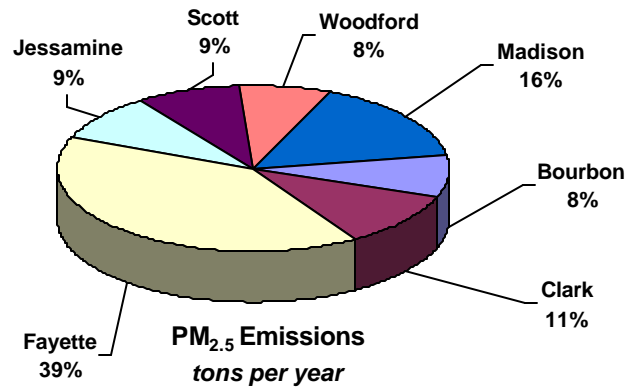
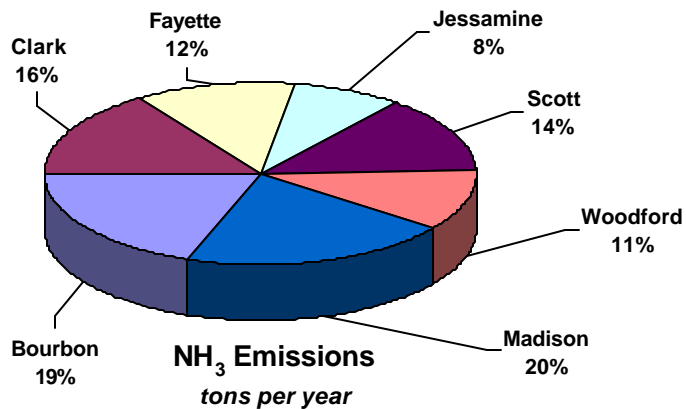
Commuting Classifications	
Not Significant	0-10%
Minimal	11-30%
High	31-50%
Significant	51% or more



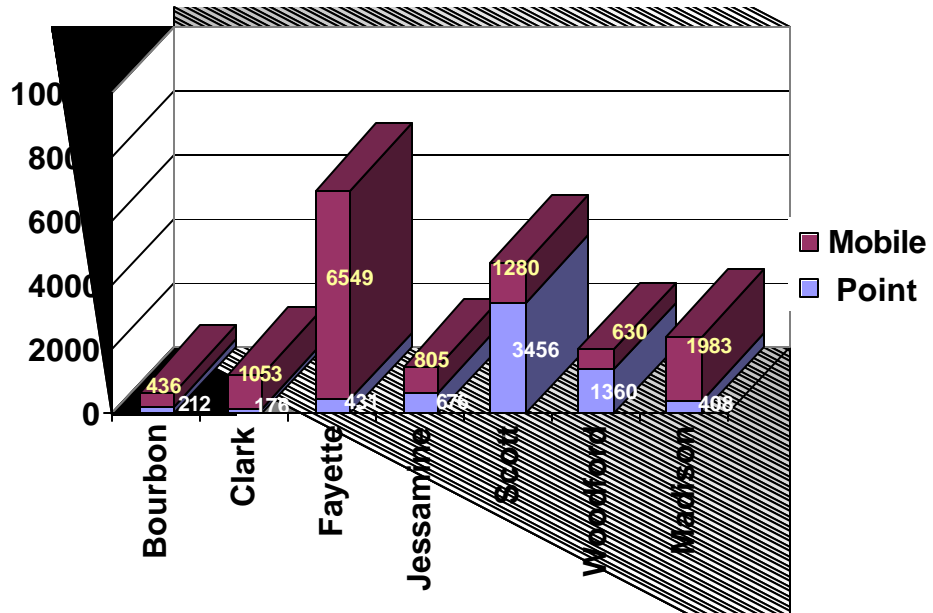
Area source  $\text{NH}_3$  emissions from Clark County were estimated at 1,295 tpy in 1999, which represents approximately 16% of the total 8,281 tpy of overall  $\text{NH}_3$  area source emissions from the Lexington MSA. (See table 1-F)

Area source  $\text{PM}_{2.5}$  emissions from Clark County were estimated at 655 tpy in 1999, which represents approximately 11% of the total 6,009 tpy of overall  $\text{PM}_{2.5}$  area source emissions from the Lexington MSA. (See table 1-G)

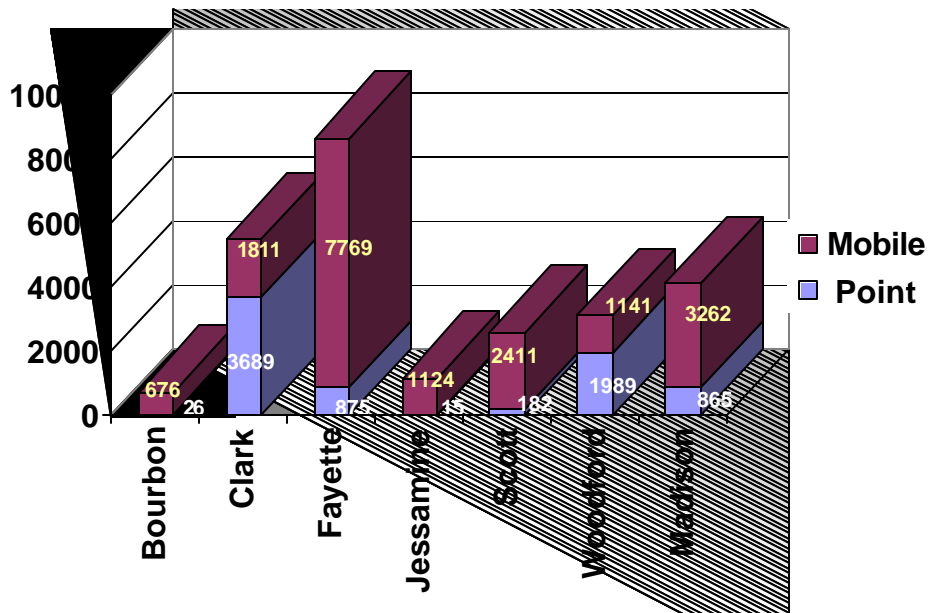
### 1999 NEI Lexington MSA Area Source Emissions (tons per year)



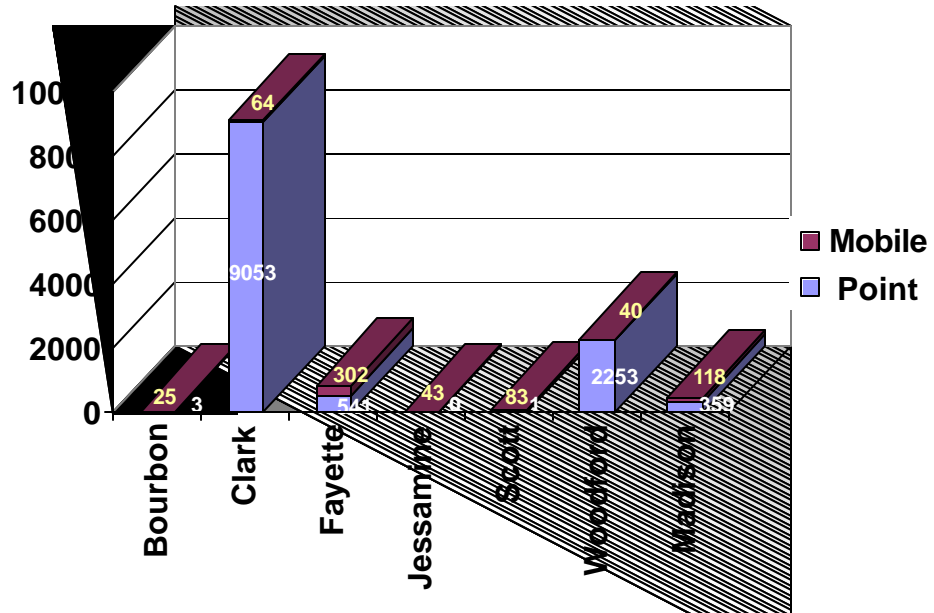
# 1999 NEI VOC Contribution (tons per year)



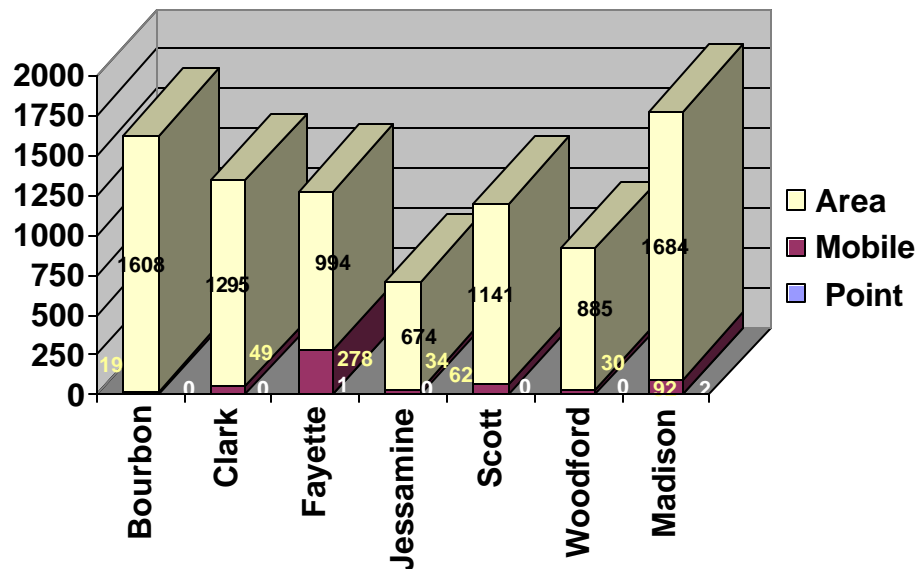
# 1999 NEI NO<sub>x</sub> Contribution (tons per year)



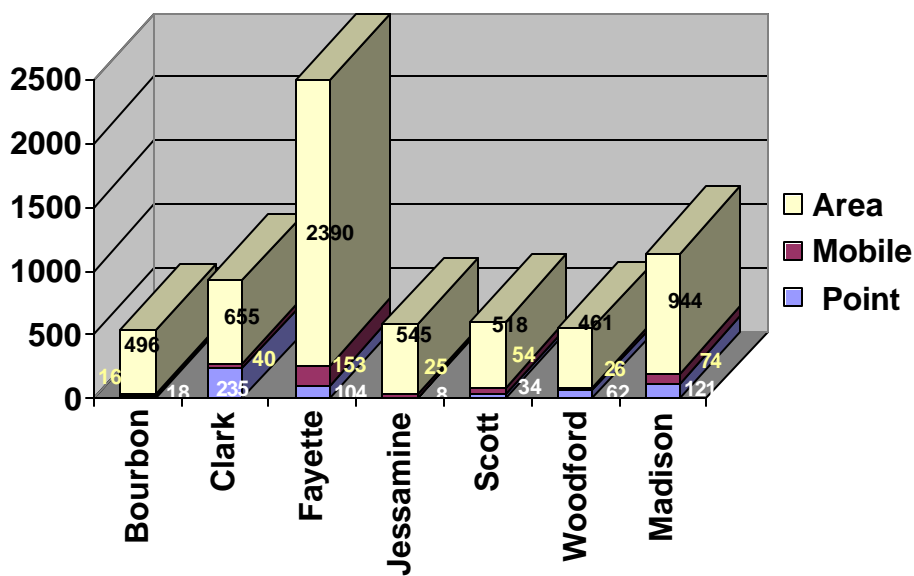
**1999 NEI SO<sub>x</sub>  
Contribution  
(tons per year)**



**1999 NEI NH<sub>3</sub>  
Contribution  
(tons per year)**



## 1999 NEI PM<sub>2.5</sub> Contribution (tons per year)



### Conclusion and Recommendation

Clark County contributes approximately 6% VOC emissions, 21% of the total NO<sub>x</sub> emissions, 71% of the total SO<sub>x</sub> emissions and 13% of the total PM<sub>2.5</sub> emissions and 15% of the total NH<sub>3</sub> emissions in the area. However, predominant wind patterns would typically have Clark County emissions moving away from the violating monitor in Fayette County. (See Figure 1-A)

The emissions data and other documentation presented indicate that Clark County, Kentucky, does not contribute a significant amount of emissions that contribute to PM<sub>2.5</sub> formation contributing to a violation of the monitor located at the Limestone monitoring site in the Lexington-Fayette MSA.

Therefore, Clark County should be designated attainment for the PM<sub>2.5</sub> standard.

## **JESSAMINE COUNTY, KENTUCKY**

Jessamine County is part of the Lexington-Fayette County, Kentucky Metropolitan Statistical Area (MSA). It is located southwest of Fayette County, northwest of Madison County, north of Garrard County, northeast of Mercer County, and southeast of Woodford County.

### **Geography/Topography**

Jessamine County has a land area of 173 square miles and is located in the Blue Grass Region of central Kentucky. The terrain ranges from rolling hills in the northern and central portions of the county, to steeper hills in the southern portions. The Kentucky River, forms the southern boundary of the county, winding through a deeply entrenched gorge where cliff-lined walls rise vertically 400 feet or more.

### **Meteorological Information**

Wind speed/wind direction information shows that the majority of the time for the period 1988-1992, the wind in the Jessamine County area came from the southwest and typically from 7-10 knots. (See figure 1-A) The mean high temperature for July for the area from 1961 through 1990 was 86°F and the mean low was 66°F. The mean precipitation for the same period was 4.8 inches.

### **Planning**

The authority for air quality planning in the Jessamine County area resides with the Kentucky Environmental and Public Protection Cabinet. Transportation planning for all of Jessamine County is performed by the Lexington Area Metropolitan Organization (LAMPO).

### **Air Monitoring**

For the 2001 - 2003 monitoring period, there were no PM<sub>2.5</sub> monitors located in Jessamine County. However, because one of two PM<sub>2.5</sub> monitors located in Fayette County, (21-067-0014) at South Limestone, shows an annual average design value of 15.6 micrograms per cubic meter, which exceeds the PM<sub>2.5</sub> annual National Ambient Air Quality Standard (NAAQS) and would be classified as a county in nonattainment, information for Jessamine County is being presented in this document. The monitoring information for 2001 - 2003 is complete for all counties in the Lexington MSA. (See table 1-A)

## **Population**

Based on projections to 2002 from the 2000 census data, there are 40,740 persons living in Jessamine County. (See table 1-C) That represents approximately 235 persons per square mile. The population of Jessamine County is approximately 30.6% rural with the remaining 69.4% living in incorporated areas. The largest city in Jessamine County is Nicholasville.

Jessamine County's population from 1990 through 2000 increased by approximately 28% (30,508 to 39,041). The population is expected to further increase by approximately 23.2% between 2000 and 2010. (See table 1-B)

Based on 2002 population data for the Lexington MSA, Jessamine County represents approximately 8.3% of the total 2002 population in the MSA area. (See table 1-C)

## **Air Emissions**

The emissions presented in this document are from the U.S. EPA's 1999 National Emission Inventory (NEI). In addition, the PM<sub>2.5</sub> emissions provided in this document are for primary PM<sub>2.5</sub> from the 1999 NEI. Primary PM<sub>2.5</sub> is directly emitted from a stack or an open source and includes filterable and condensable particles.

## **Point Sources**

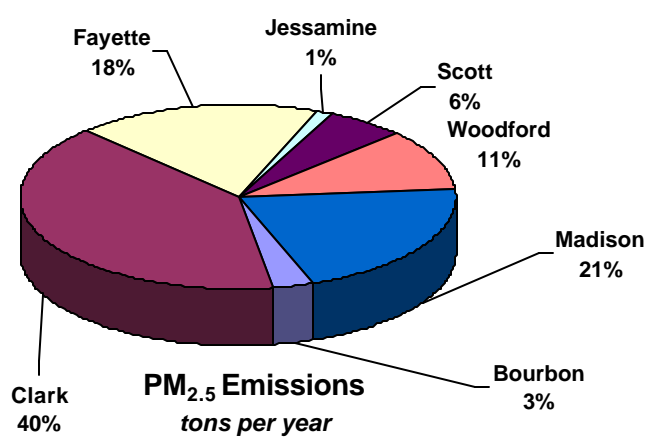
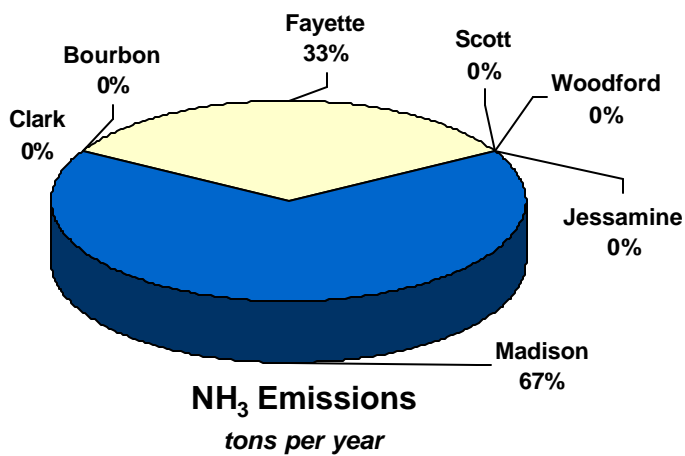
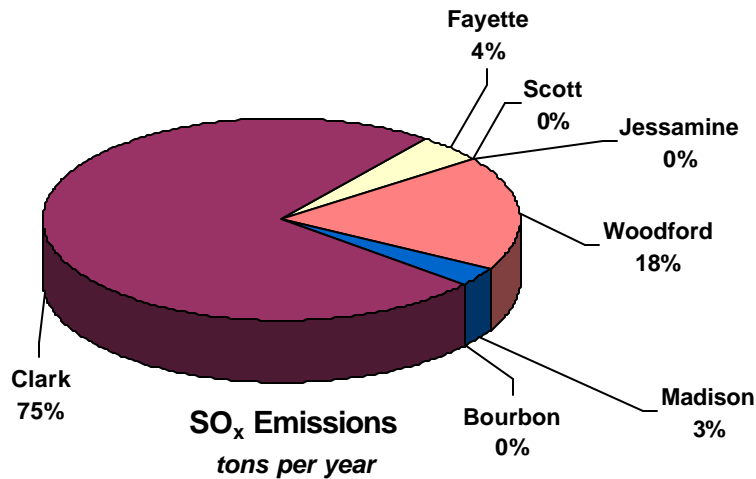
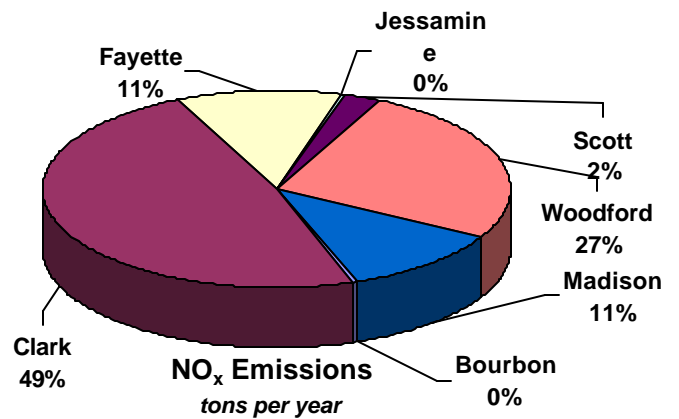
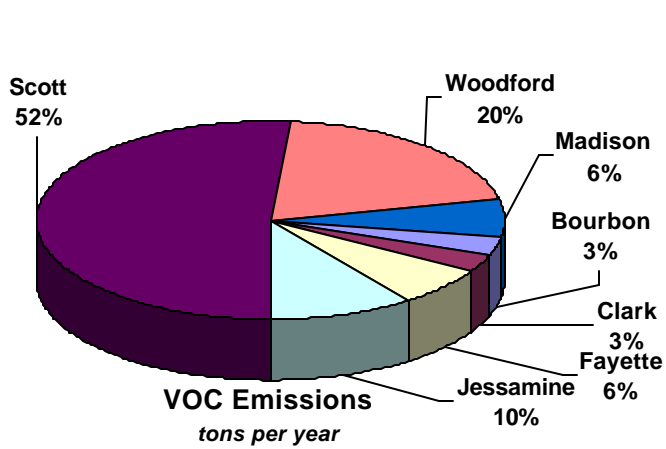
Point source VOC emissions from Jessamine County were estimated at 676 tons per year in 1999, which represents approximately 10% of the total 6,719 tpy overall VOC point source emissions from the Lexington MSA. Point source NO<sub>x</sub> emissions from Jessamine County were estimated at 15 tpy in 1999, which represents less than 1% of the total 7,641 tpy overall NO<sub>x</sub> point source emissions from the Lexington MSA. (See table 1-D)

Point source SO<sub>x</sub> emissions from Jessamine County were estimated at 0 tons per year in 1999. (See table 1-E)

Point source NH<sub>3</sub> emissions from Jessamine County were estimated at 0 tpy in 1999. (See table 1-F)

Point source PM<sub>2.5</sub> emissions from Jessamine County were estimated at 8 tons per year in 1999, which represents approximately 1% of the total 582 tpy overall PM<sub>2.5</sub> point source emissions from the Lexington MSA. (See table 1- G)

# 1999 NEI Lexington Area Point Source Emissions (tons per year)



Point sources located within Jessamine County are subject to PSD requirements, CTG RACT requirements, Maximum Achievable Control Technology (MACT) requirements for sources of Hazardous Air Pollutants, and New Source Performance Standards (NSPS).

## Onroad Mobile

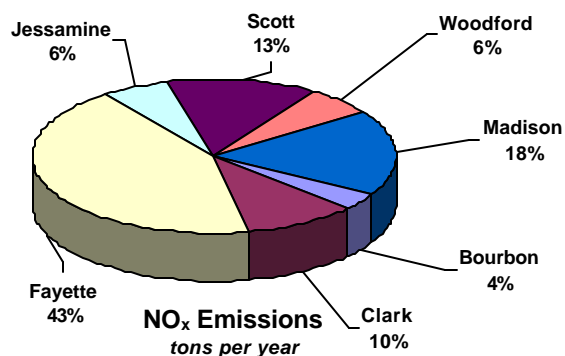
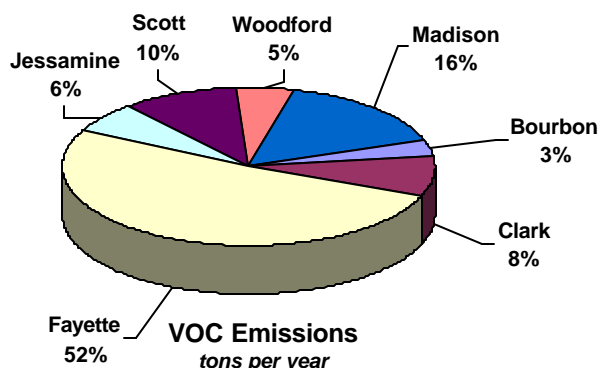
Onroad mobile source VOC emissions from Jessamine County were estimated at 805 tons per year (tpy) in 1999, which represents approximately 6% of the total 12,736 tpy of overall VOC onroad mobile source emissions from the Lexington MSA. Onroad mobile source NO<sub>x</sub> emissions from Jessamine County were estimated at 1,124 tpy in 1999, which represents approximately 6% of the total 18,194 tpy of overall NO<sub>x</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-D)

Onroad mobile source SO<sub>x</sub> emissions from Jessamine County were estimated at 43 tons per year in 1999, which represents approximately 6% of the total 675 tpy overall SO<sub>x</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-E)

Onroad mobile source NH<sub>3</sub> emissions from Jessamine County were estimated at 34 tpy in 1999, which represents approximately 6% of the total 564 tpy overall NH<sub>3</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-F)

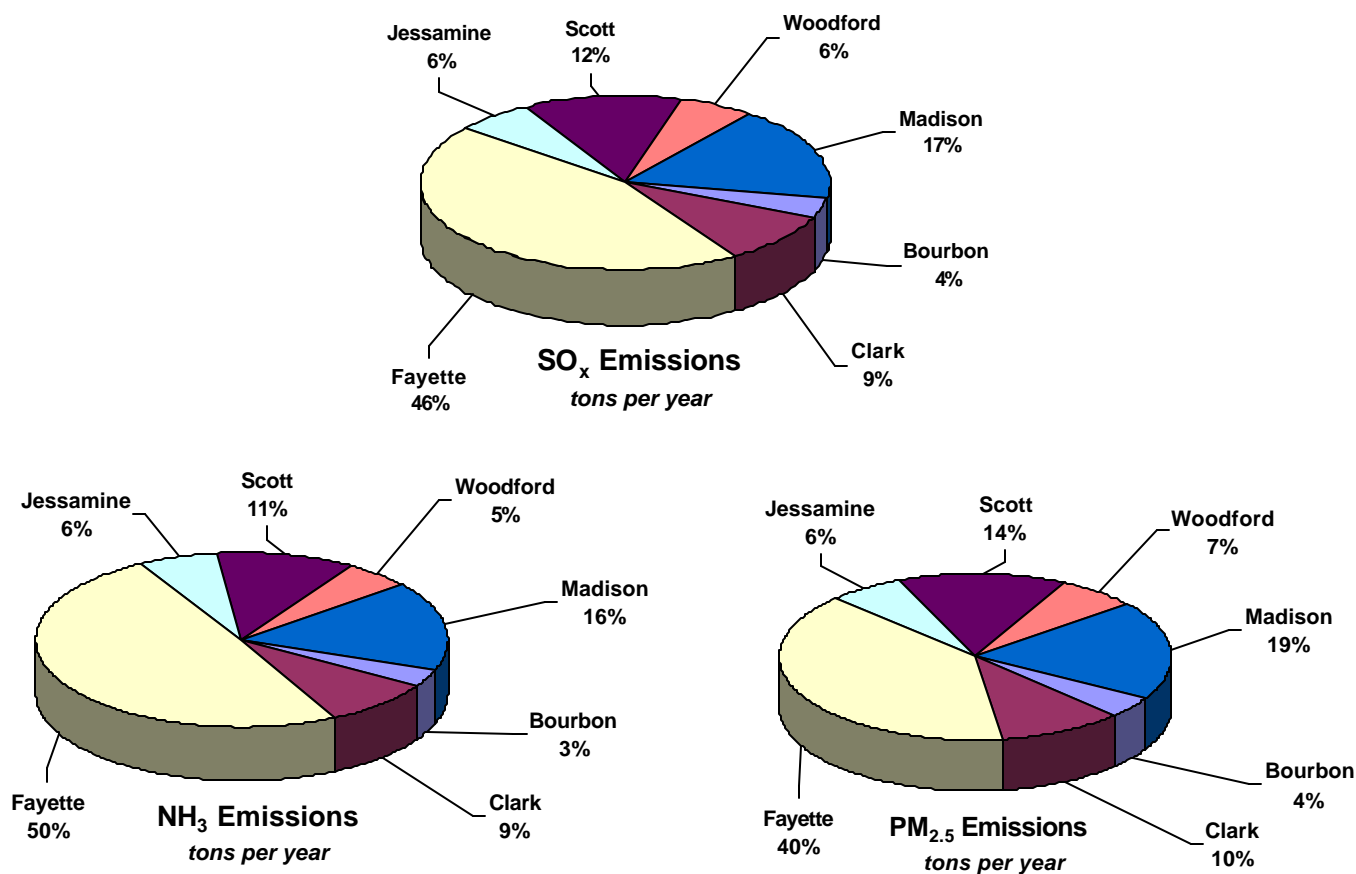
Onroad mobile source PM<sub>2.5</sub> emissions from Jessamine County were estimated at 25 tons per year (tpy) in 1999, which represents approximately 6% of the total 388 tpy overall PM<sub>2.5</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-G)

## 1999 NEI Lexington MSA Onroad Mobile Source Emissions (tons per year)





# **1999 NEI Lexington MSA Onroad Mobile Source Emissions (continued)**



Based on information received from the Kentucky Transportation Cabinet, commuting traffic from other counties into Jessamine County is 40.8% and classified as high, and the commuting traffic from Jessamine County into other counties is significant at 53.8%.

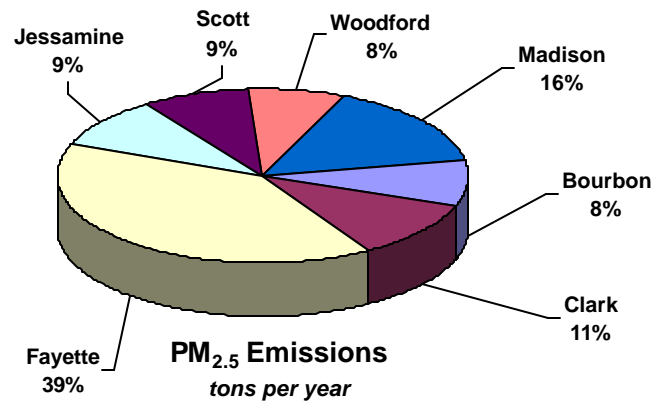
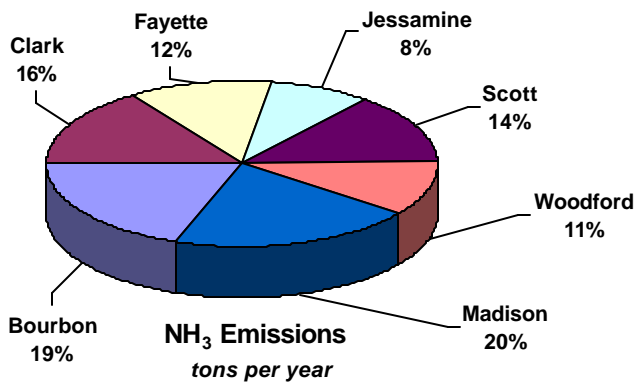
Commuting Classifications	
Not Significant	0-10%
Minimal	11-30%
High	31-50%
Significant	51% or more

## Area Sources

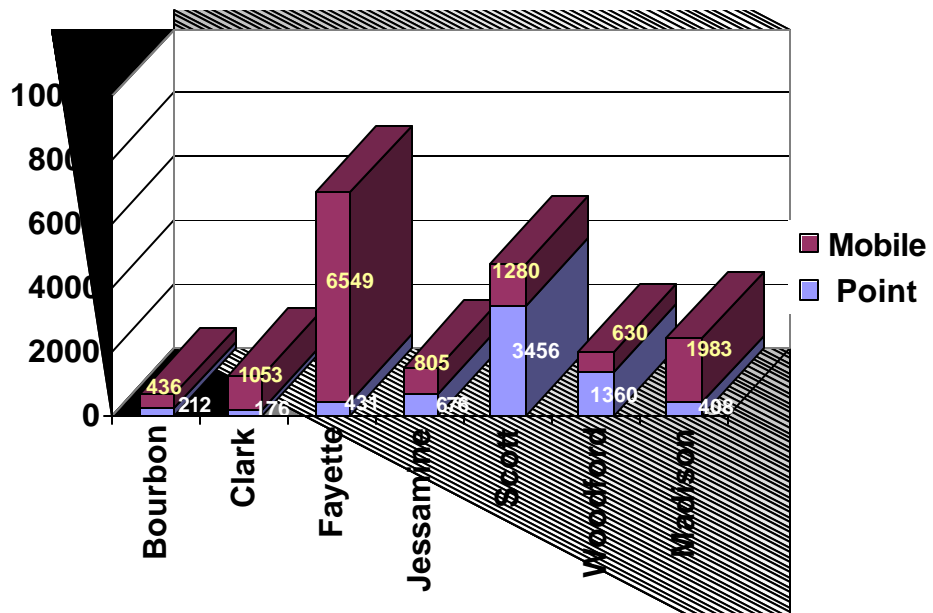
Area source  $\text{NH}_3$  emissions from Jessamine County were estimated at 674 tpy in 1999, which represents approximately 8% of the total 8,281 tpy of overall  $\text{NH}_3$  area source emissions from the Lexington MSA. (See table 1-F)

Area source  $\text{PM}_{2.5}$  emissions from Jessamine County were estimated at 545 tpy in 1999, which represents approximately 9% of the total 6,009 tpy of overall  $\text{PM}_{2.5}$  area source emissions from the Lexington MSA. (See table 1-G)

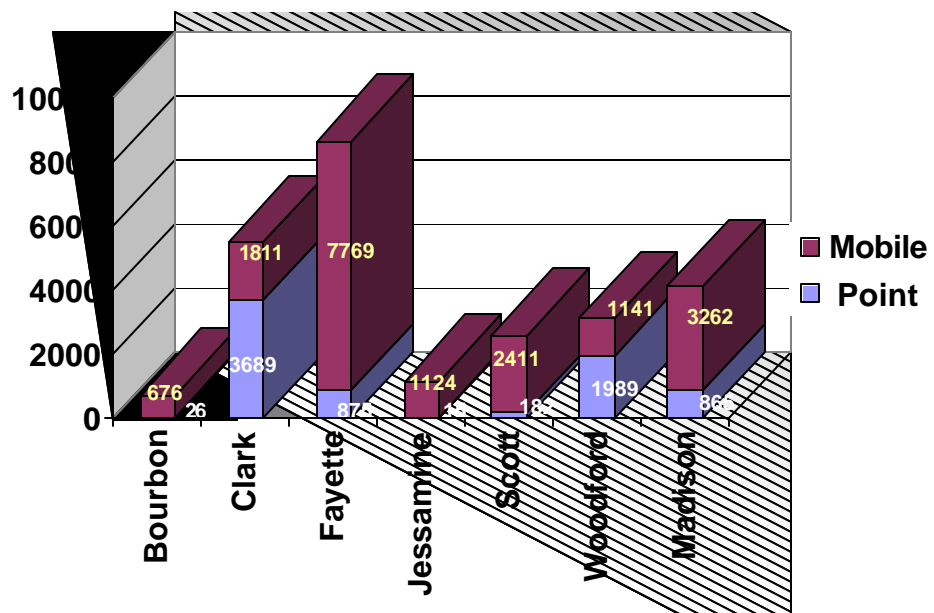
### 1999 NEI Lexington MSA Area Source Emissions (tons per year)



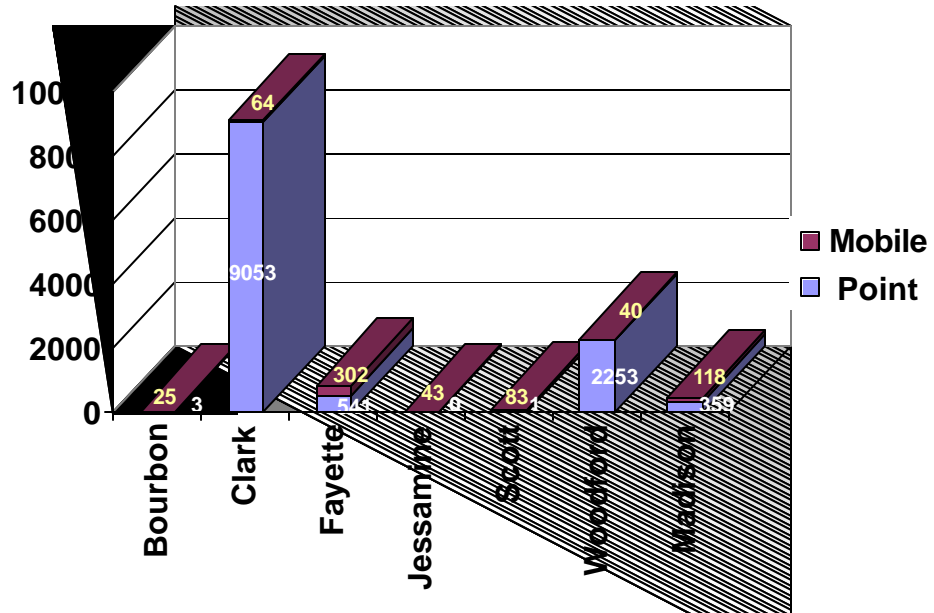
# 1999 NEI VOC Contribution (tons per year)



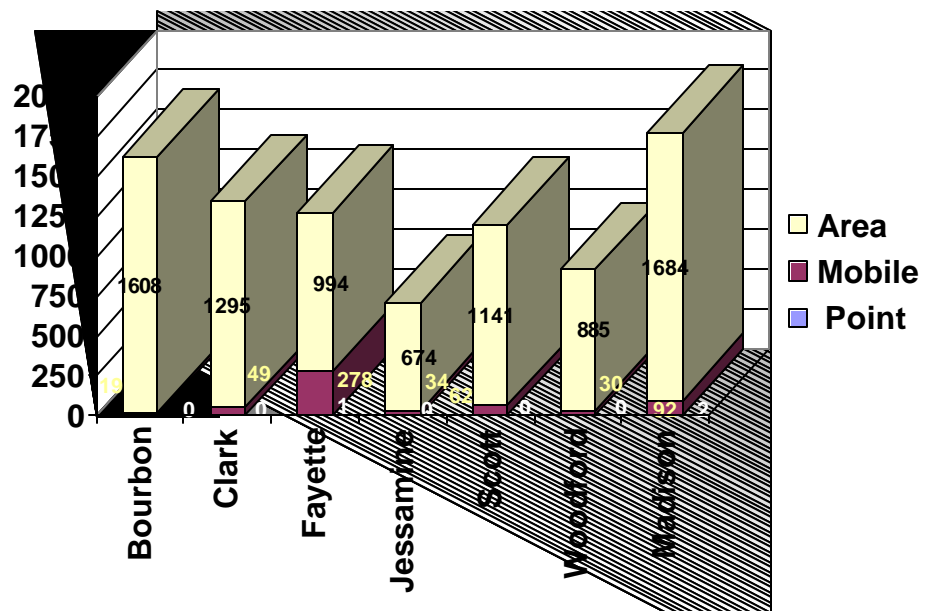
# 1999 NEI NO<sub>x</sub> Contribution (tons per year)



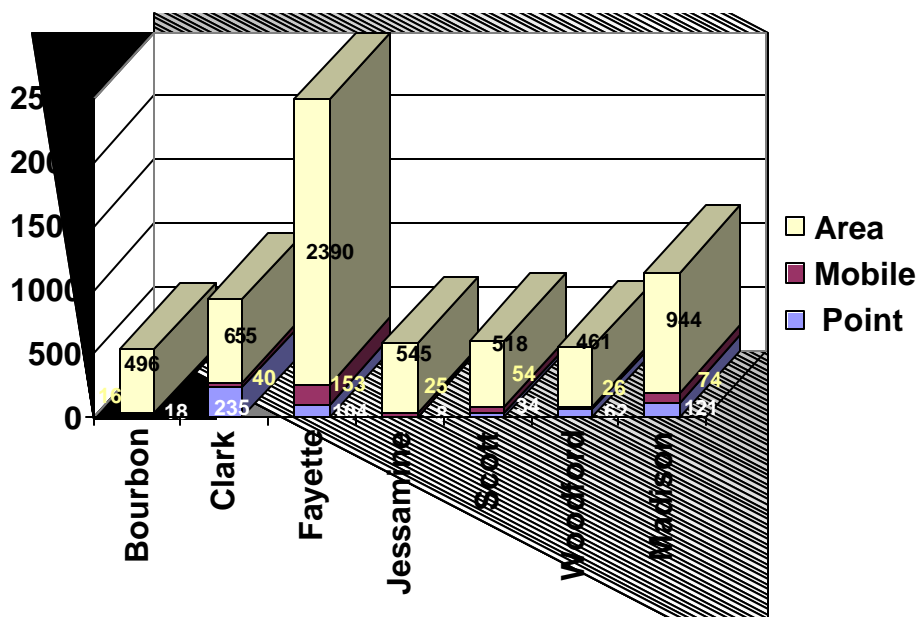
**1999 NEI SO<sub>x</sub>  
Contribution  
(tons per year)**



**1999 NEI NH<sub>3</sub>  
Contribution  
(tons per year)**



## 1999 NEI PM<sub>2.5</sub> Contribution (tons per year)



### Conclusion and Recommendation

The emissions data and other documentation presented indicate that Jessamine County does not contribute a significant amount of PM<sub>2.5</sub> or emissions that contribute to PM<sub>2.5</sub> formation in the Lexington-Fayette MSA.

Jessamine County contributes approximately 7.6% of VOC emissions, 4% of the total NO<sub>x</sub> emissions, less than 1% of the total SO<sub>x</sub> emissions and 8% of the total PM<sub>2.5</sub> emissions and 8% of the total NH<sub>3</sub> emissions in the area.

Therefore, Jessamine County should be designated attainment for the PM<sub>2.5</sub> standard.

## **MADISON COUNTY, KENTUCKY**

Madison County is part of the Lexington, Kentucky Metropolitan Statistical Area (MSA). It is located southwest of Clark County, west of Estill County, northwest of Jackson County, north of Rockcastle County, northeast of Garrard County, east of Jessamine County, and southeast of Fayette County.

### **Geography/Topography**

Madison County has a land area of 440 square miles and is located in the central Kentucky's Blue Grass Region, an area famous for its many beautiful horse farms and gently-rolling topography.

### **Meteorological Information**

Due to the close proximity of Lexington, Kentucky, meteorological data from Lexington was used for the Madison county area. Wind speed/wind direction information shows that the majority of the time for the period 1988-1992, the wind in the Madison County area came from the southwest and typically from 7-10 knots. (See figure 1-A) The mean high temperature for July for the area from 1961 through 1990 was 86°F and the mean low was 66°F. The mean precipitation for the same period was 4.8 inches.

### **Planning**

The authority for air quality planning in the Madison County area resides with the Kentucky Environmental and Public Protection Cabinet. Transportation planning for all of Madison County is performed by the Kentucky Transportation Cabinet.

### **Air Monitoring**

For the 2001 - 2003 monitoring period, the PM<sub>2.5</sub> monitor (21-151-0003) at Richmond, Madison County, Kentucky, shows an annual average design value of 13.4 micrograms per cubic meter, which achieves the National Ambient Air Quality Standards (NAAQS) and would be classified as a county in attainment. The PM<sub>2.5</sub> monitor (21-067-0012) at Newtown Pike in Fayette County, Kentucky, shows an annual average design value of 14.9 micrograms per cubic meter, which is in attainment of the standard.

However, because the PM<sub>2.5</sub> monitor (21-067-0014) at South Limestone in Fayette County, Kentucky, shows an annual average design value of 15.6 micrograms per cubic meter, which exceeds the PM<sub>2.5</sub> annual National Ambient

Air Quality Standard (NAAQS) and would be classified as a county in nonattainment, information for Madison County is being presented in this document. The monitoring information for 2003 is complete for all counties in the Lexington MSA. (See table 1-A)

## **Population**

Based on projections to 2002 from the 2000 census data, there are 73,334 persons living in Madison County. (See table 1-C) That represents approximately 167 persons per square mile. The population of Madison County is approximately 41.4% rural with the remaining 58.6% living in incorporated areas. The largest city in Madison County is Richmond.

Madison County's population from 1990 through 2000 increased by approximately 23.2% (57,508 to 70,872). The population is expected to increase by approximately 18.0% between 2000 and 2010. (See table 1-B)

Based on 2002 population data for the Lexington MSA, Madison County represents approximately 15.0% of the total 2002 population in the MSA area. (See table 1-C)

## **Air Emissions**

The emissions presented in this document are from the U.S. EPA's 1999 National Emission Inventory (NEI). In addition, the PM<sub>2.5</sub> emissions provided in this document are for primary PM<sub>2.5</sub> from the 1999 NEI. Primary PM<sub>2.5</sub> is directly emitted from a stack or an open source and includes filterable and condensable particles.

## **Point Sources**

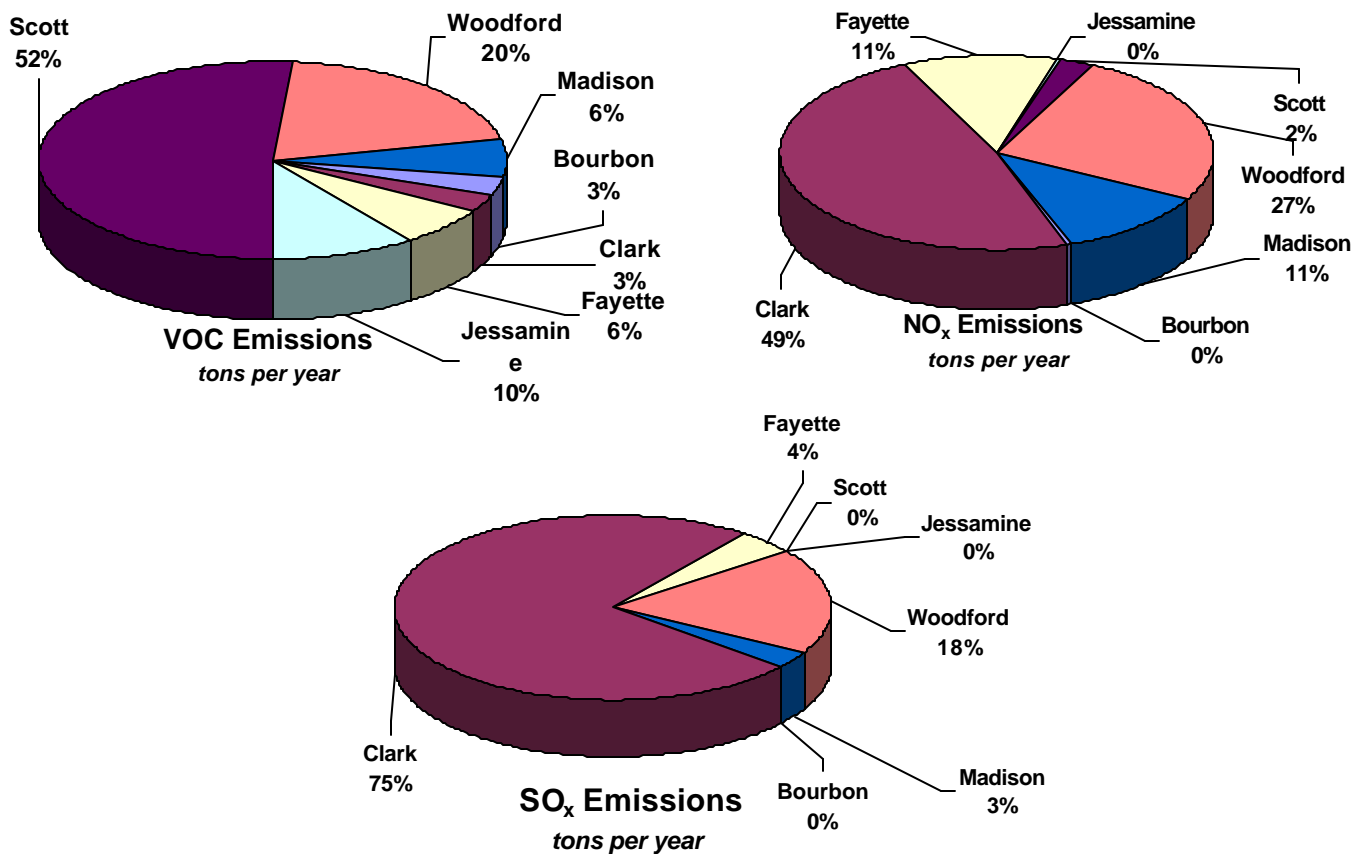
Point source VOC emissions from Madison County were estimated at 408 tons per year (tpy) in 1999, which represents approximately 6% of the total 6,719 tpy overall VOC point source emissions from the Lexington MSA. Point source NO<sub>x</sub> emissions from Madison County were estimated at 865 tpy in 1999, which represents approximately 11% of the total 7,641 tpy overall NO<sub>x</sub> point source emissions from the Lexington MSA. (See table 1-D)

Point source SO<sub>x</sub> emissions from Madison County were estimated at 359 tons per year in 1999, which represents approximately 3% of the total 12,210 tpy overall SO<sub>x</sub> point source emissions from the Lexington MSA. (See table 1-E)

Point source  $\text{NH}_3$  emissions from Madison County were estimated at 2 tpy in 1999, which represents 67% of the total 3 tpy overall  $\text{NH}_3$  point source emissions from the Lexington MSA. (See table 1-F)

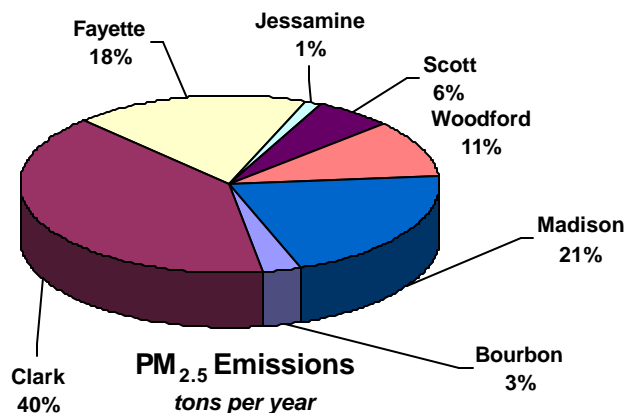
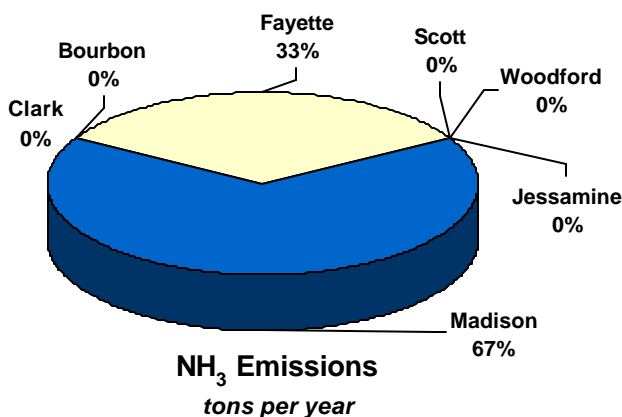
Point source  $\text{PM}_{2.5}$  emissions from Madison County were estimated at 121 tons per year (tpy) in 1999, which represents approximately 21% of the total 582 tpy overall  $\text{PM}_{2.5}$  point source emissions from the Lexington MSA. (See table 1- G)

### 1999 NEI Lexington Area Point Source Emissions (tons per year)





## 1999 NEI Lexington Area Point Source Emissions (continued)



Point sources located within Madison County are subject to PSD requirements, CTG RACT requirements, Maximum Achievable Control Technology (MACT) requirements for sources of Hazardous Air Pollutants, and New Source Performance Standards (NSPS).

### Onroad Mobile

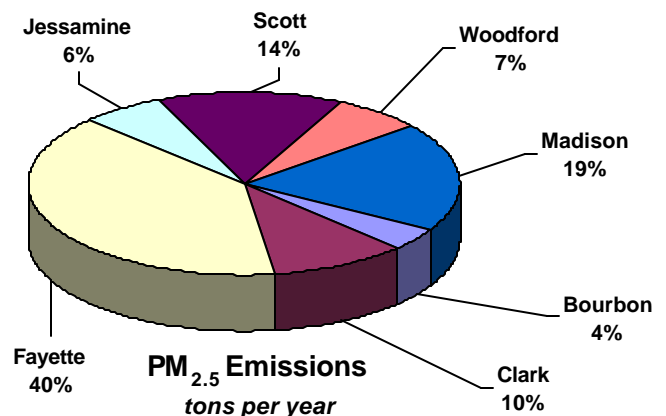
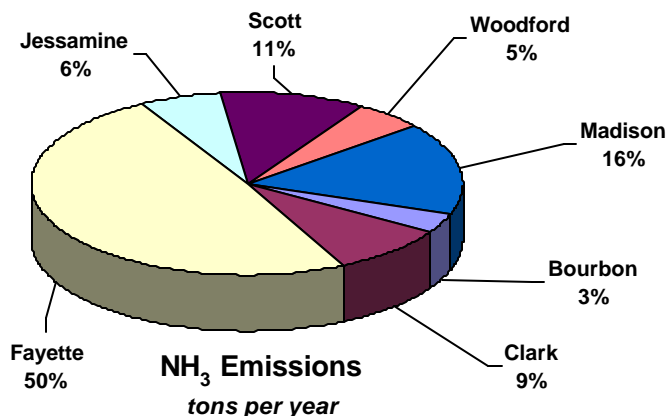
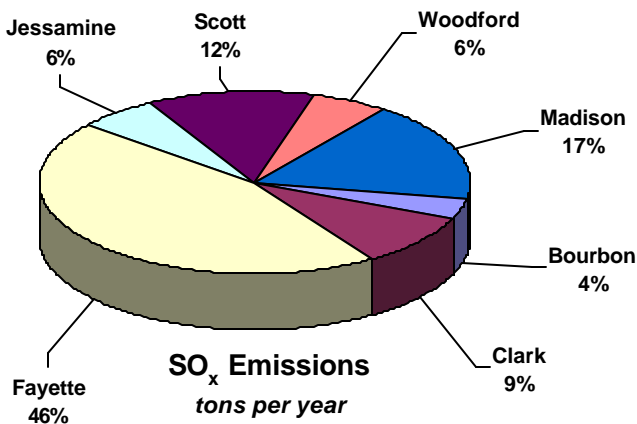
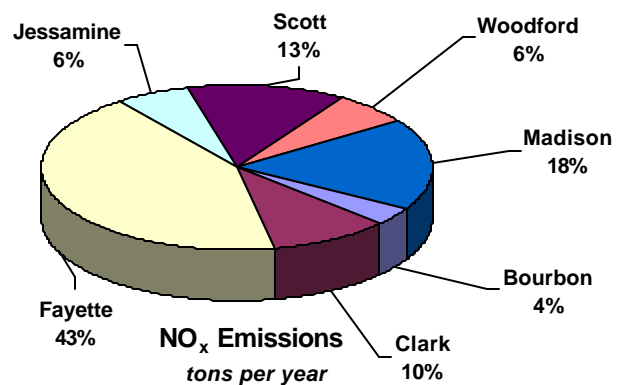
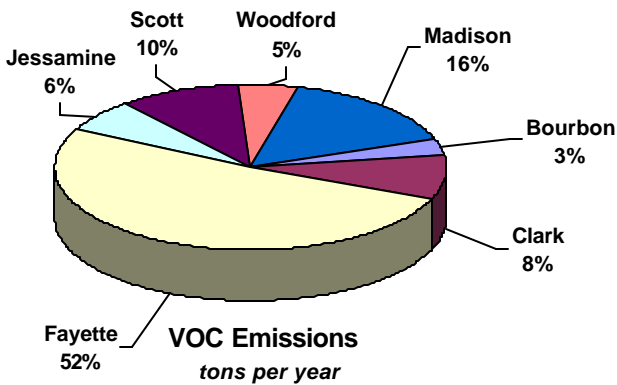
Onroad mobile source VOC emissions from Madison County were estimated at 1,983 tons per year (tpy) in 1999, which represents approximately 16% of the total 12,736 tpy of overall VOC onroad mobile source emissions from the Lexington MSA. Onroad mobile source NO<sub>x</sub> emissions from Madison County were estimated at 3,362 tpy in 1999, which represents approximately 18% of the total 18,194 tpy of overall NO<sub>x</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-D)

Onroad mobile source SO<sub>x</sub> emissions from Madison County were estimated at 118 tons per year (tpy) in 1999, which represents approximately 17% of the total 675 tpy overall SO<sub>x</sub> point source emissions from the Lexington MSA. (see table 1-E)

Onroad mobile source NH<sub>3</sub> emissions from Madison County were estimated at 92 tpy in 1999, which represents approximately 16% of the total 564 tpy overall NH<sub>3</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-F)

Onroad mobile source PM<sub>2.5</sub> emissions from Madison County were estimated at 74 tons per year (tpy) in 1999, which represents approximately 19% of the total 388 tpy overall PM<sub>2.5</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-G)

## 1999 NEI Lexington MSA Onroad Mobile Source Emissions (tons per year)



Based on information received from the Kentucky Transportation Cabinet, commuting traffic from other counties into Madison County is 23.6% and classified as minimal, and the commuting traffic from Madison County into other counties is minimal at 30.2%.

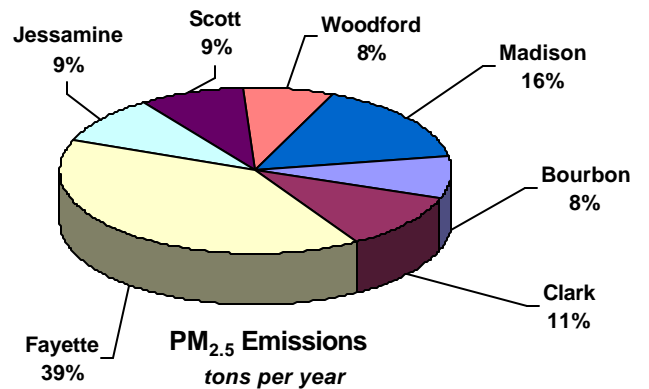
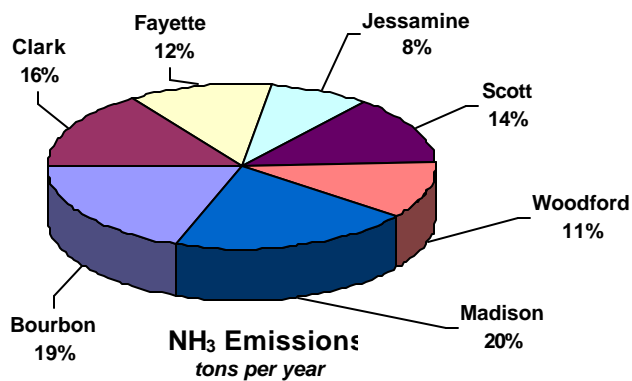
Commuting Classifications	
Not Significant	0-10%
Minimal	11-30%
High	31-50%
Significant	51% or more

### Area Sources

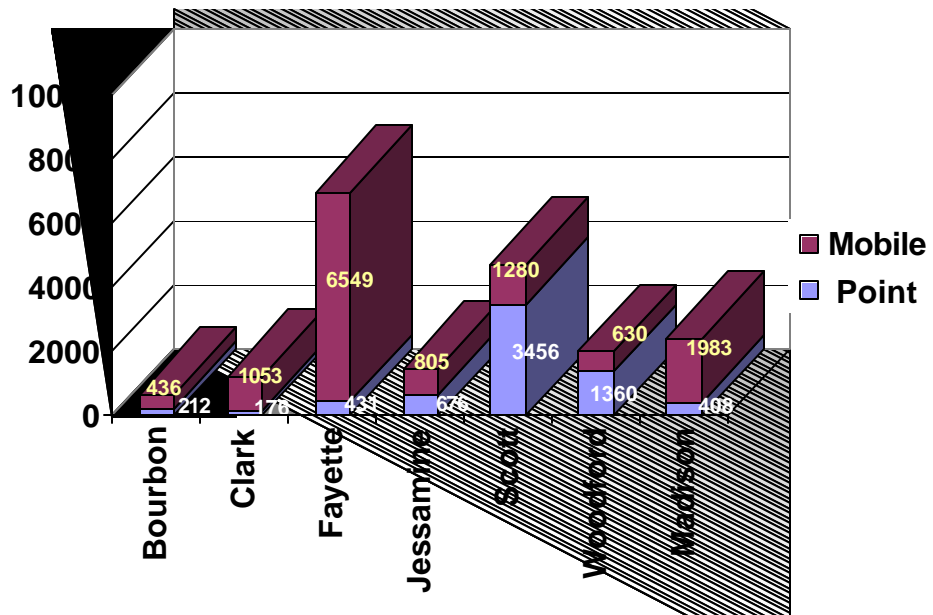
Area source  $\text{NH}_3$  emissions from Madison County were estimated at 1,684 tpy in 1999, which represents approximately 20% of the total 8,281 tpy of overall  $\text{NH}_3$  area source emissions from the Lexington MSA. (See Table 1-F)

Area source  $\text{PM}_{2.5}$  emissions from Madison County were estimated at 944 tpy in 1999, which represents approximately 16% of the total 6,009 tpy of overall  $\text{PM}_{2.5}$  area source emissions from the Lexington MSA. (See table 1-G)

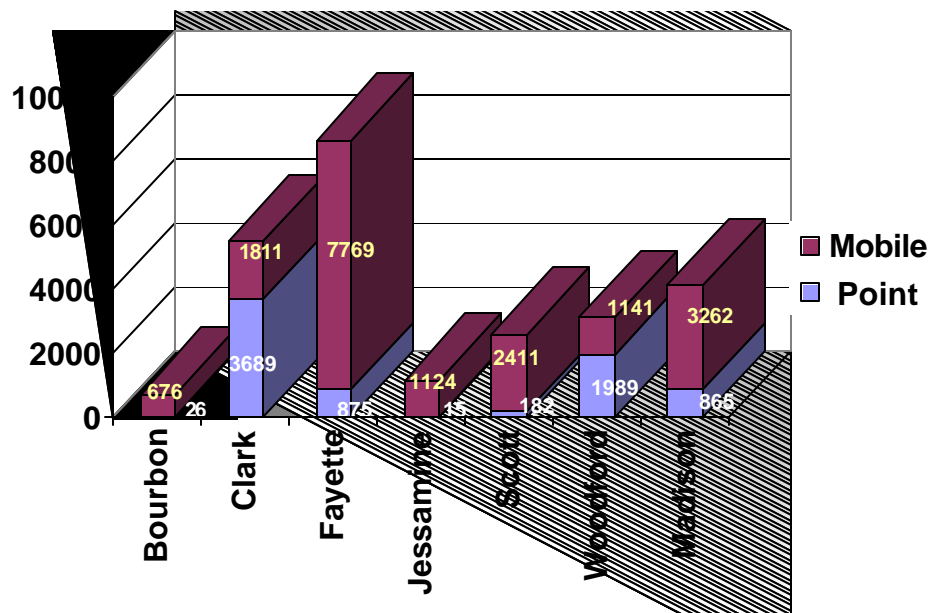
### 1999 NEI Lexington MSA Area Source Emissions (tons per year)



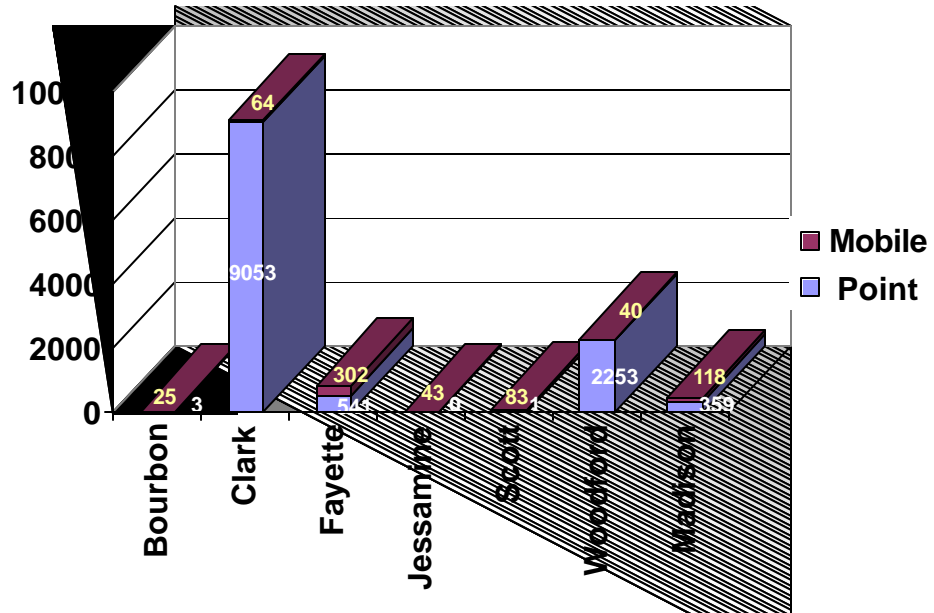
# 1999 NEI VOC Contribution (tons per year)



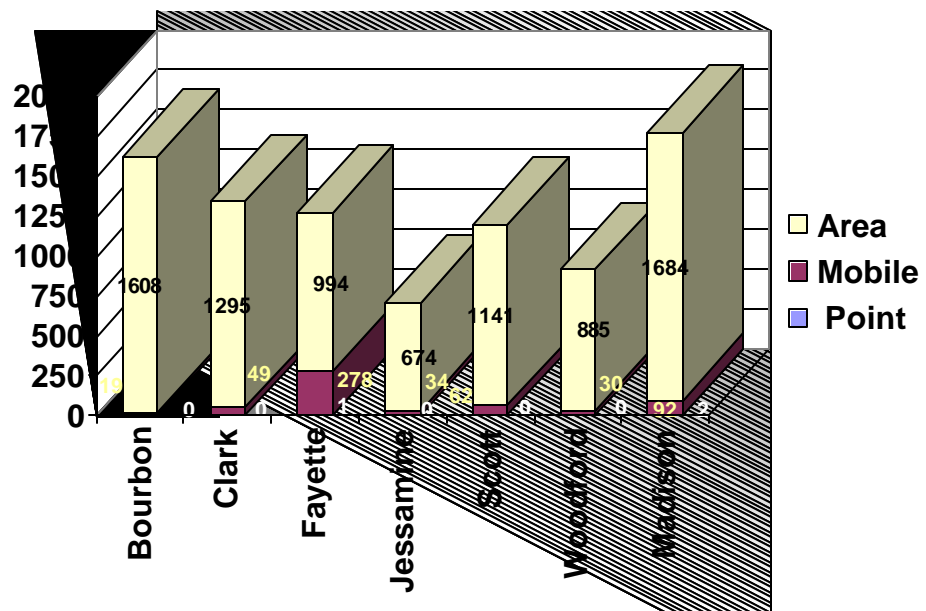
# 1999 NEI NO<sub>x</sub> Contribution (tons per year)



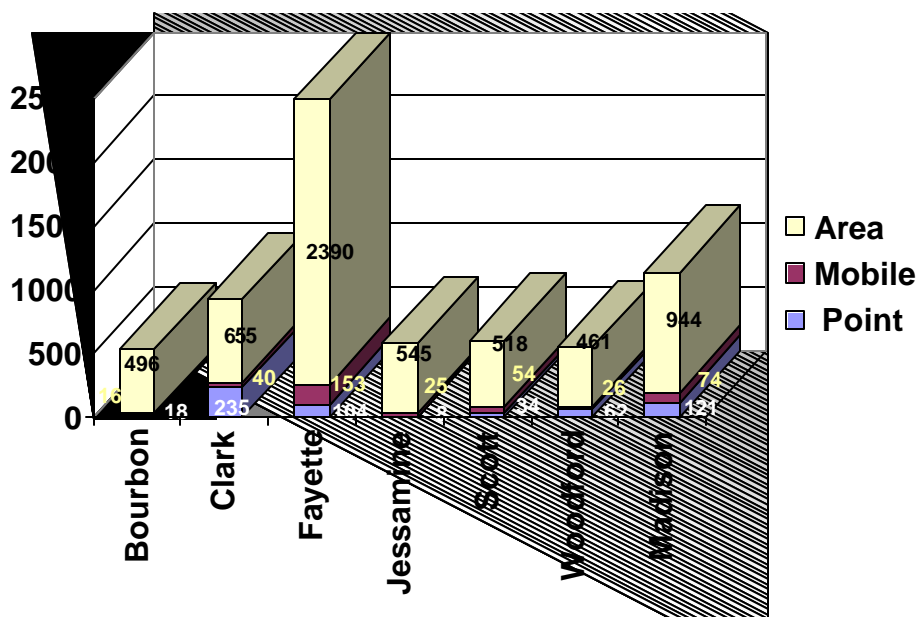
**1999 NEI SO<sub>x</sub>  
Contribution  
(tons per year)**



**1999 NEI NH<sub>3</sub>  
Contribution  
(tons per year)**



## 1999 NEI PM<sub>2.5</sub> Contribution (tons per year)



### Conclusion and Recommendation

Madison County, based on 2001 - 2003 PM<sub>2.5</sub> monitoring data, is meeting the annual PM<sub>2.5</sub> standard with annual average reading of 13.4 micrograms per cubic meter.

Madison County emissions contributions are approximately 12% VOC, 16% NO<sub>x</sub>, 3% SO<sub>x</sub>, 20% NH<sub>3</sub>, and 16% PM<sub>2.5</sub> of the total emissions for the region.

Predominant wind patterns would typically have Madison County emissions moving away from the violating monitor in Fayette County. (See Figure 1-A)

The monitoring and emissions data and other documentation presented indicate that Madison County, Kentucky, does not contribute a significant amount of emissions that contribute to PM<sub>2.5</sub> formation in the Lexington-Fayette MSA, and monitoring data shows the area to be meeting the standard. Therefore, Madison County should be designated attainment for the PM<sub>2.5</sub> standard.

## **SCOTT COUNTY, KENTUCKY**

Scott County is part of the Lexington-Fayette County, Kentucky Metropolitan Statistical Area (MSA) and is located directly on the I-75 north-south interstate corridor. It is located southwest of Harrison County, northwest of Bourbon County, north northwest of Fayette County, north northeast of Woodford County, east of Franklin County, southeast of Owen County, and south of Grant County.

### **Geography/Topography**

Scott County has a land area of 285 square miles and is located in the Blue Grass Region of central Kentucky, a scenic area famous for its many beautiful horse farms and low rolling hills.

### **Meteorological Information**

Wind speed/wind direction information shows that the majority of the time for the period 1988-1992, the wind in the Scott County area came from the southwest and typically from 7-10 knots. (See figure 1-A) The mean high temperature for July for the area from 1961 through 1990 was 86°F and the mean low was 66°F. The mean precipitation for the same period was 4.8 inches.

### **Planning**

The authority for air quality planning in the Scott County area resides with the Kentucky Environmental and Public Protection Cabinet. Transportation planning for all of Scott County is performed by the Kentucky Transportation Cabinet.

### **Air Monitoring**

For the 2001 - 2003 monitoring period, there were no PM<sub>2.5</sub> monitors located in Scott County. The PM<sub>2.5</sub> monitor (21-067-0012) at Newtown Pike in Fayette County, Kentucky, shows an annual average design value of 14.9 micrograms per cubic meter, which is in attainment of the standard. However, because the PM<sub>2.5</sub> monitor (21-067-0014) at South Limestone in Fayette County, Kentucky, shows an annual average design value of 15.6 micrograms per cubic meter, which exceeds the PM<sub>2.5</sub> annual National Ambient Air Quality Standard (NAAQS) and would be classified as a county in nonattainment, information for

Scott County is being presented in this document. The monitoring information for 2003 is complete for all counties in the Lexington MSA. (See table 1-A)

## **Population**

Based on projections to 2002 from the 2000 census data, there are 35,320 persons living in Scott County. (See table 1-C) That represents approximately 124 persons per square mile. The population of Scott County is approximately 42.4% rural with the remaining 57.6% living in incorporated areas. The largest city in Scott County is Georgetown.

Scott County's population from 1990 through 2000 increased by approximately 38.5% (23,867 to 33,061). The population is expected to further increase by approximately 35.7% between 2000 and 2010. (See table 1-B)

Based on 2002 population data for the Lexington MSA, Scott County represents approximately 7.2% of the total 2002 population in the MSA area. (See table 1-C)

## **Air Emissions**

The emissions presented in this document are from the U.S. EPA's 1999 National Emission Inventory (NEI). In addition, the PM<sub>2.5</sub> emissions provided in this document are for primary PM<sub>2.5</sub> from the 1999 NEI. Primary PM<sub>2.5</sub> is directly emitted from a stack or an open source and includes filterable and condensable particles.

## **Point Sources**

Point source VOC emissions from Scott County were estimated at 3,456 tons per year in 1999, which represents approximately 52% of the total 6,719 tpy overall VOC point source emissions from the Lexington MSA. Point source NO<sub>x</sub> emissions from Scott County were estimated at 182 tpy in 1999, which represents approximately 2% of the total 7,641 tpy overall NO<sub>x</sub> point source emissions from the Lexington MSA. (See table 1-D)

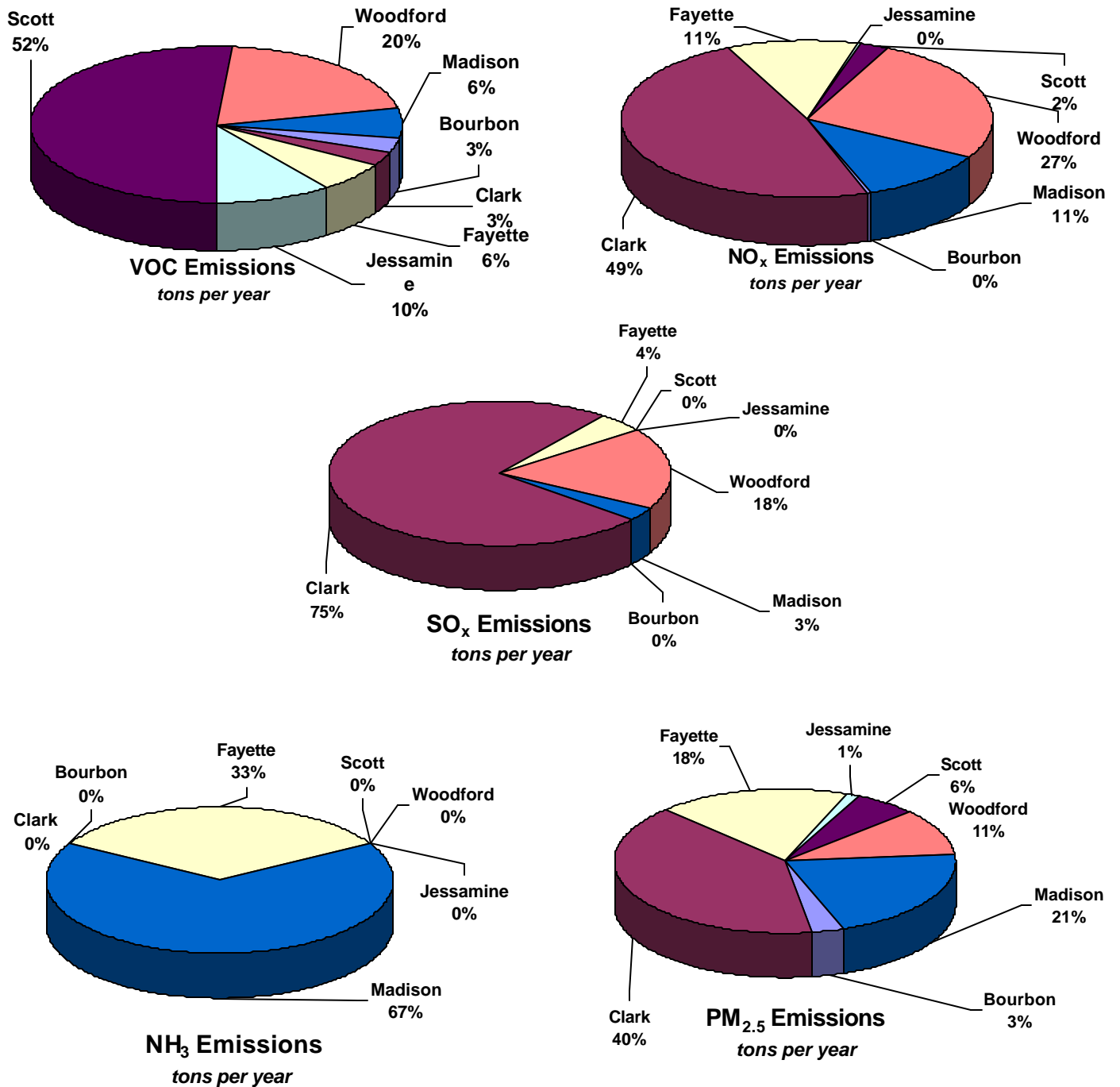
Point source SO<sub>x</sub> emissions from Scott County were estimated at 1 ton per year in 1999, which represents less than 1% of the total 12,210 tpy overall SO<sub>x</sub> point source emissions from the Lexington MSA. (See table 1-E)

Point source NH<sub>3</sub> emissions from Scott County were estimated at 0 tpy in 1999. (See table 1-F)



Point source PM<sub>2.5</sub> emissions from Scott County were estimated at 34 tons per year (tpy) in 1999, which represents approximately 6% of the total 582 tpy overall PM<sub>2.5</sub> point source emissions from the Lexington MSA. (See table 1- G)

## 1999 NEI Lexington Area Point Source Emissions (tons per year)



Point sources located within Scott County are subject to PSD requirements, CTG RACT requirements, Maximum Achievable Control Technology (MACT) requirements for sources of Hazardous Air Pollutants, and New Source Performance Standards (NSPS).

### Onroad Mobile

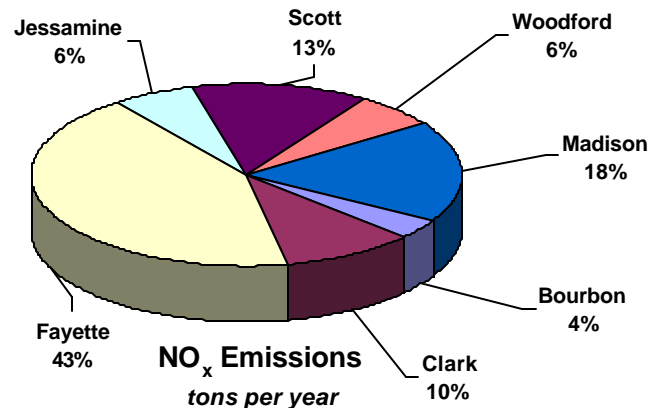
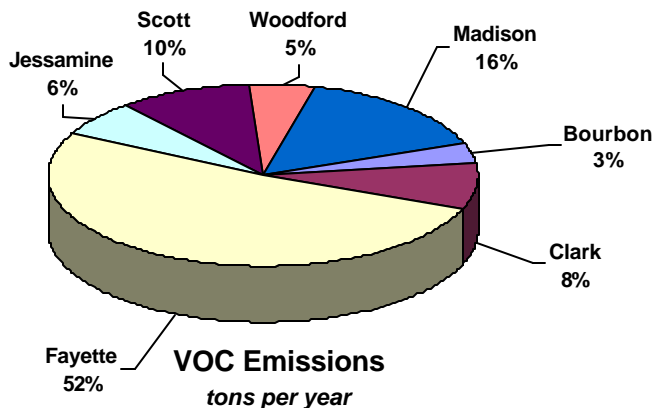
Onroad mobile source VOC emissions from Scott County were estimated at 1,280 tons per year (tpy) in 1999, which represents approximately 10% of the total 12,736 tpy of overall VOC onroad mobile source emissions from the Lexington MSA. Onroad mobile source NO<sub>x</sub> emissions from Scott County were estimated at 2,411 tpy in 1999, which represents approximately 13% of the total 18,194 tpy of overall NO<sub>x</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-D)

Onroad mobile source SO<sub>x</sub> emissions from Scott County were estimated at 83 tons per year (tpy) in 1999, which represents approximately 12% of the total 675 tpy overall SO<sub>x</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-E)

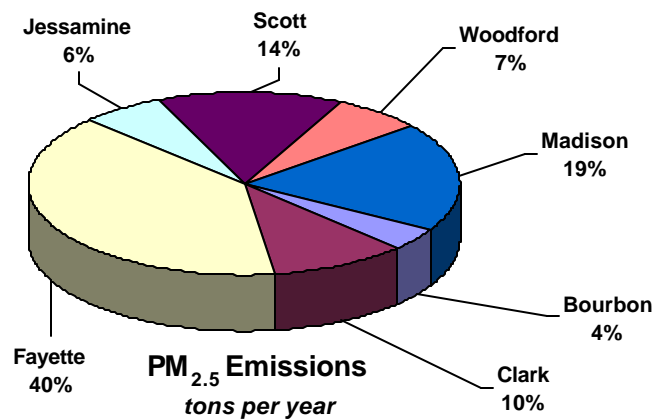
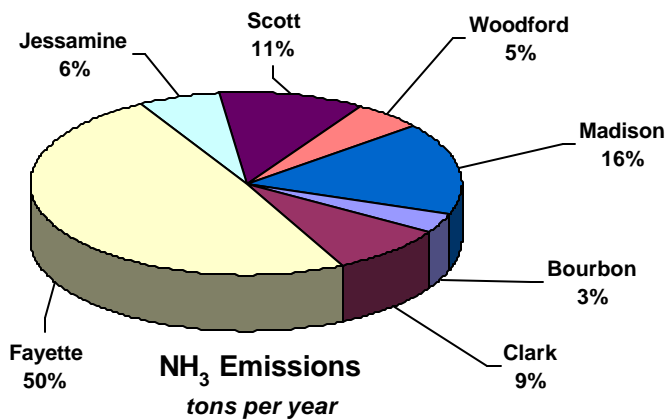
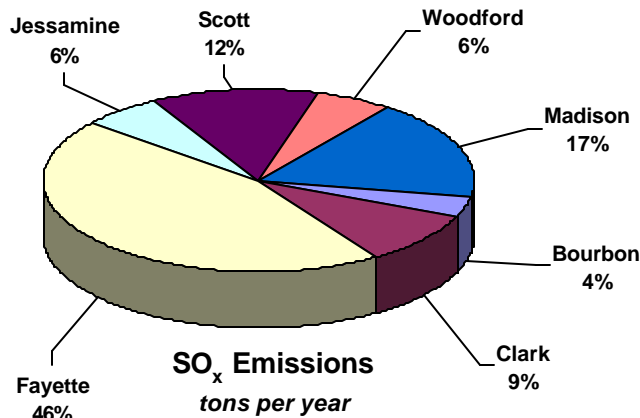
Onroad mobile source NH<sub>3</sub> emissions from Scott County were estimated at 62 tpy in 1999, which represents approximately 11% of the total 564 tpy overall NH<sub>3</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-F)

Onroad mobile source PM<sub>2.5</sub> emissions from Scott County were estimated at 54 tons per year (tpy) in 1999, which represents approximately 14% of the total 388 tpy overall PM<sub>2.5</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-G)

### 1999 NEI Lexington MSA Onroad Mobile Source Emissions (tons per year)



# **1999 NEI Lexington MSA Onroad Mobile Source Emissions (continued)**



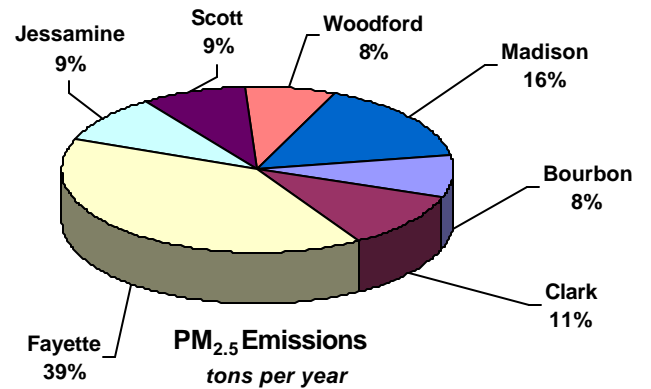
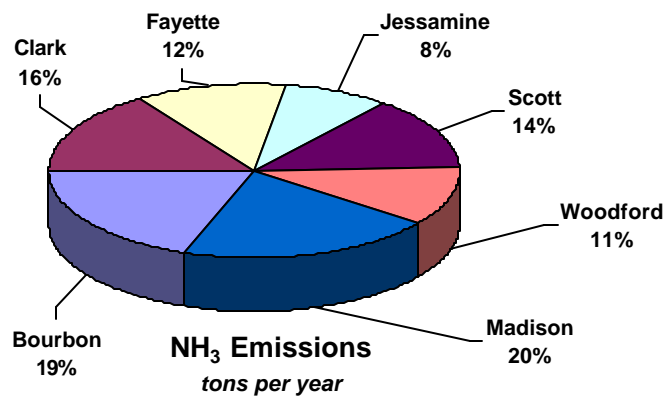
Based on information received from the Kentucky Transportation Cabinet, commuting traffic from other counties into Scott County is 56.9% and classified as significant, and the commuting traffic from Scott County into other counties is high at 38.6%.

Commuting Classifications	
Not Significant	0-10%
Minimal	11-30%
High	31-50%
Significant	51% or more

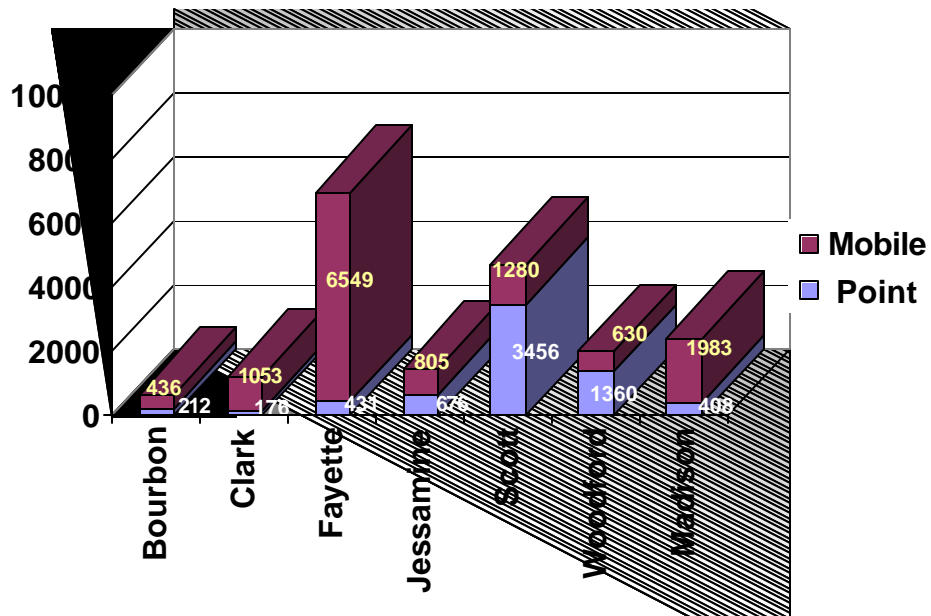
Area source  $\text{NH}_3$  emissions from Scott County were estimated at 1,141 tpy in 1999, which represents approximately 14% of the total 8,281 tpy of overall  $\text{NH}_3$  area source emissions from the Lexington MSA. (See table 1-F)

Area source  $\text{PM}_{2.5}$  emissions from Scott County were estimated at 518 tpy in 1999, which represents approximately 9% of the total 6,009 tpy of overall  $\text{PM}_{2.5}$  area source emissions from the Lexington MSA. (See table 1-G)

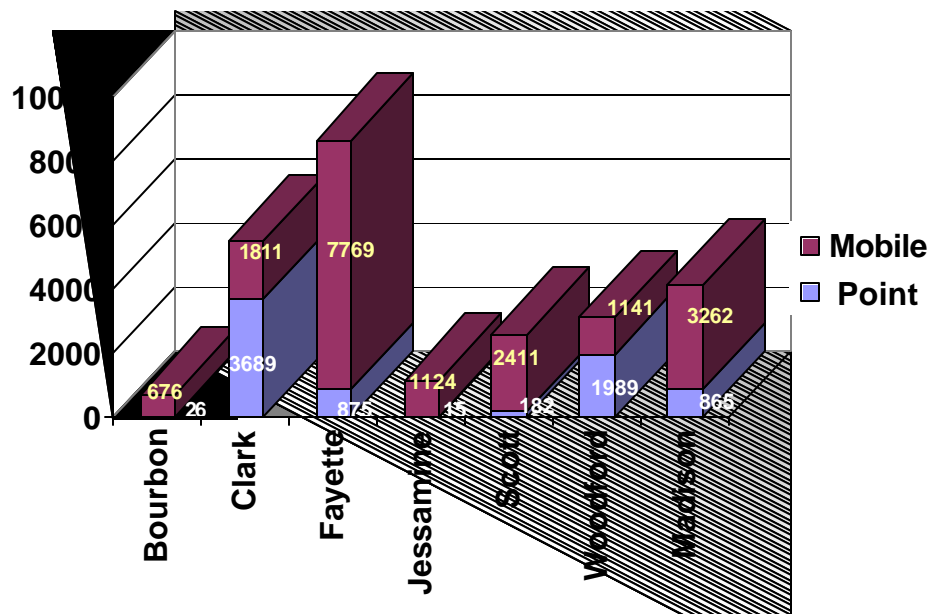
### 1999 NEI Lexington MSA Area Source Emissions (tons per year)



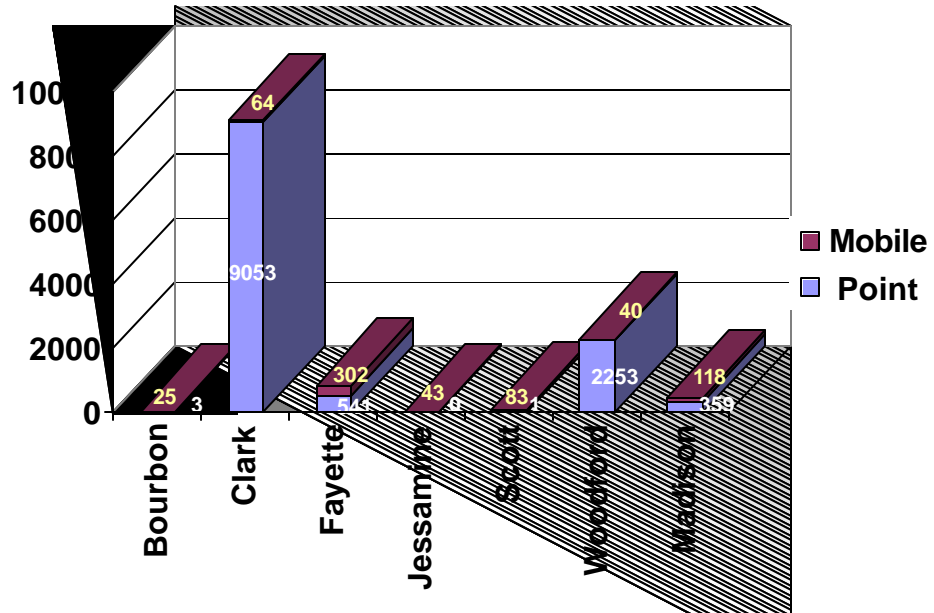
# 1999 NEI VOC Contribution (tons per year)



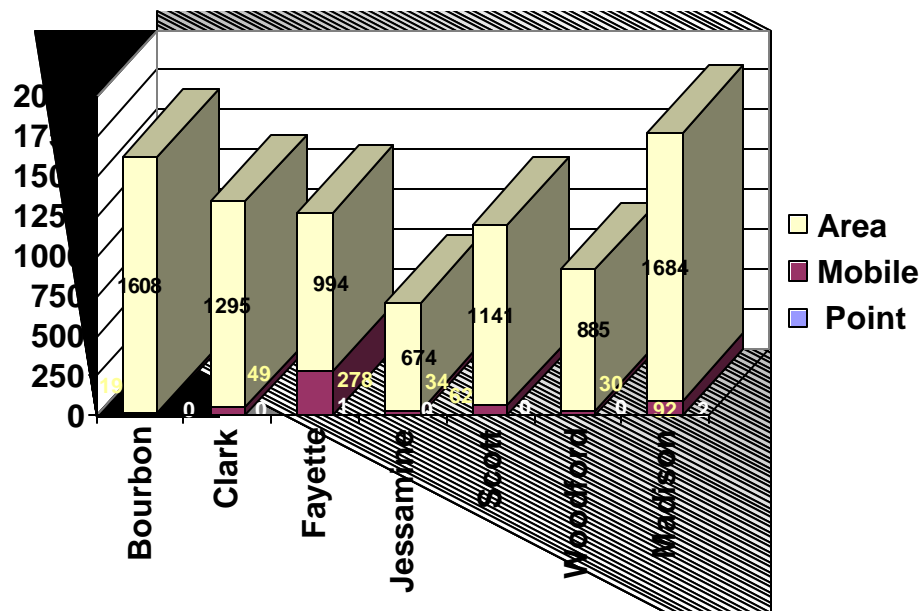
# 1999 NEI NO<sub>x</sub> Contribution (tons per year)



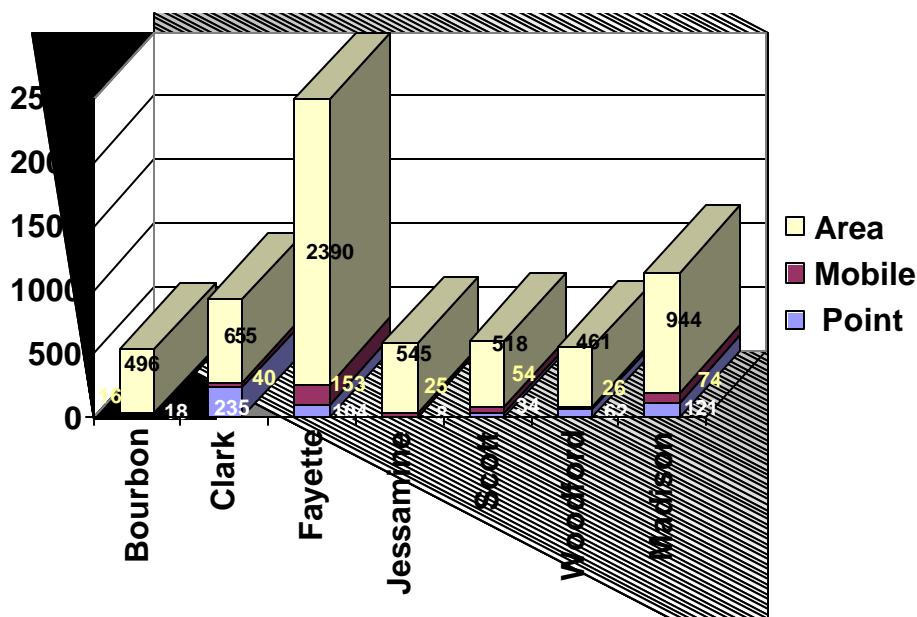
**1999 NEI SO<sub>x</sub>  
Contribution  
(tons per year)**



**1999 NEI NH<sub>3</sub>  
Contribution  
(tons per year)**



## 1999 NEI PM<sub>2.5</sub> Contribution (tons per year)



### Conclusion and Recommendation

Scott County contributes approximately VOC 24% of the total VOC emissions, 10% of the total NO<sub>x</sub> emissions, 1% of the total SO<sub>x</sub> emissions and 9% of the total PM<sub>2.5</sub> emissions and 14% of the total NH<sub>3</sub> emissions in the area. These emissions provide an insignificant contribution to fine particulate levels in the overall area.

Additionally, predominant wind patterns would typically have Scott County emissions moving away from the violating monitor in Fayette County with the violation (the Limestone Monitor). If an impact were to occur, typically emissions from Scott County would impact the Newtown monitor which is in attainment of the standard.

The emissions data and other documentation presented indicate that Scott County, Kentucky, does not contribute a significant amount of emissions that contribute to PM<sub>2.5</sub> formation in the Lexington-Fayette MSA.

Therefore, based the documentation presented Scott County should be designated attainment for the PM<sub>2.5</sub> standard.

## **WOODFORD COUNTY, KENTUCKY**

Woodford County is part of the Lexington-Fayette County, Kentucky Metropolitan Statistical Area (MSA). It is located southeast of Scott County, east of Fayette County, northeast of Jessamine County, northwest of Mercer County, east of Anderson County, and southeast of Franklin County. The northern tip of the county lies on the I-64 east-west interstate corridor.

### **Geography/Topography**

Woodford County has a land area of 190 square miles and is located in the Blue Grass Region of central Kentucky, a scenic area famous for its many beautiful horse farms and low rolling hills.

### **Meteorological Information**

Wind speed/wind direction information shows that the majority of the time for the period 1988-1992, the wind in the Woodford County area came from the southwest and typically from 7-10 knots. (See figure 1-A) The mean high temperature for July for the area from 1961 through 1990 was 86°F and the mean low was 66°F. The mean precipitation for the same period was 4.8 inches.

### **Planning**

The authority for air quality planning in the Woodford County area resides with the Kentucky Environmental and Public Protection Cabinet. Transportation planning for all of Woodford County is performed by the Kentucky Transportation Cabinet.

### **Air Monitoring**

For the 2001 - 2003 monitoring period, there were no PM<sub>2.5</sub> monitors located in Woodford County. The PM<sub>2.5</sub> monitor (21-067-0012) at Newtown Pike in Fayette County, Kentucky, shows an annual average design value of 14.9 micrograms per cubic meter, which is in attainment of the standard. However, because the PM<sub>2.5</sub> monitor (21-067-0014) at South Limestone in Fayette County, Kentucky, shows an annual average design value of 15.6 micrograms per cubic meter, which exceeds the PM<sub>2.5</sub> annual National Ambient Air Quality Standard (NAAQS) and would be classified as a county in nonattainment, information for Woodford County is being presented in this document. The monitoring



information for 2003 is complete for all counties in the Lexington MSA. (See table 1-A)

## **Population**

Based on projections to 2002 from the 2000 census data, there are 23,403 persons living in Woodford County. (See table 1-C) That represents approximately 123 persons per square mile. The population of Woodford County is approximately 41.2% rural with the remaining 58.8% living in incorporated areas. The largest city in Woodford County is Versailles.

Woodford County's population from 1990 through 2000 increased by approximately 16.3% (19,955 to 23,208). The population is expected to further increase by approximately 13.9% between 2000 and 2010. (See table 1-B)

Based on 2002 population data for the Lexington MSA, Woodford County represents approximately 4.8% of the total 2002 population in the MSA area. (See table 1-C)

## **Air Emissions**

The emissions presented in this document are from the U.S. EPA's 1999 National Emission Inventory (NEI). In addition, the PM<sub>2.5</sub> emissions provided in this document are for primary PM<sub>2.5</sub> from the 1999 NEI. Primary PM<sub>2.5</sub> is directly emitted from a stack or an open source and includes filterable and condensable particles.

## **Point Source**

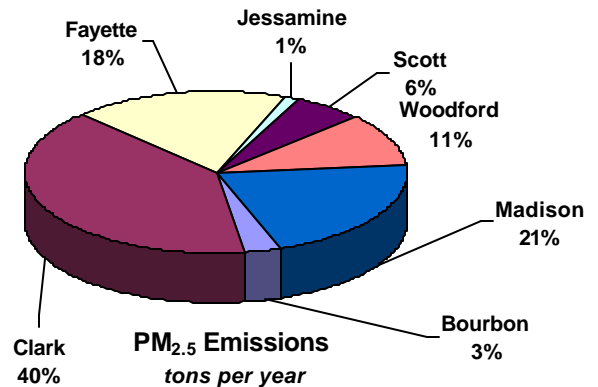
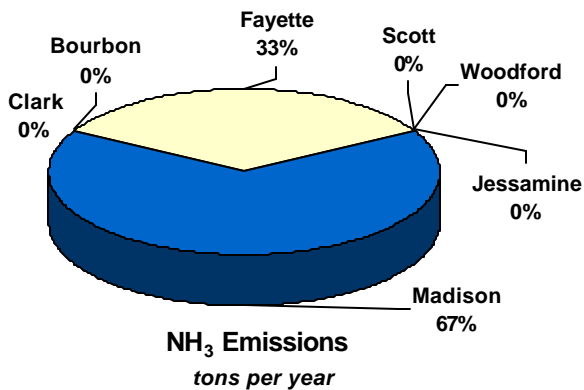
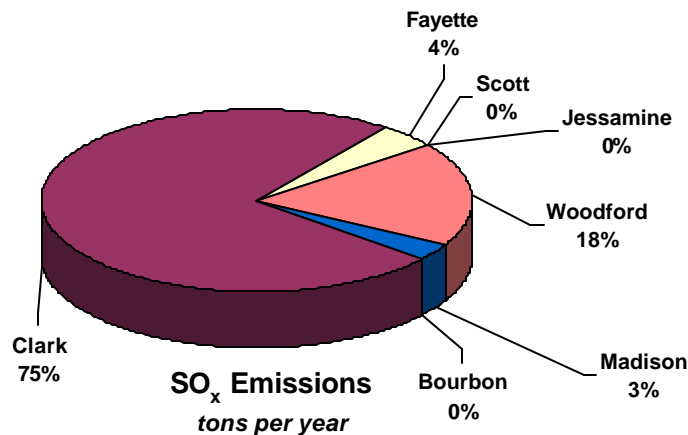
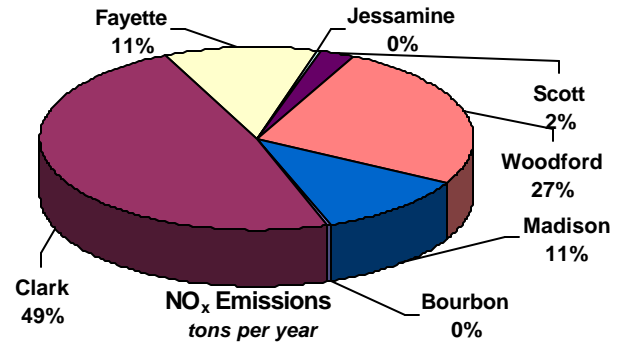
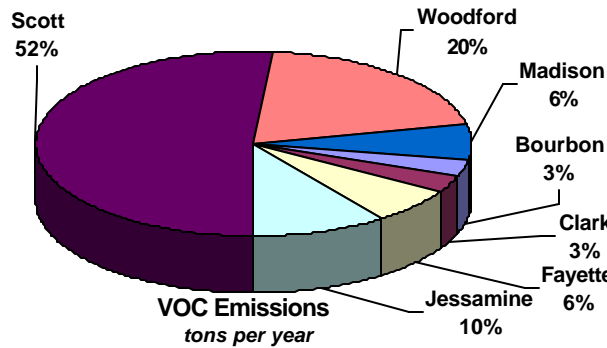
Point source VOC emissions from Woodford County were estimated at 1,360 tons per year (tpy) in 1999, which represents approximately 20% of the total 6,719 tpy overall VOC point source emissions from the Lexington MSA. Point source NO<sub>x</sub> emissions from Woodford County were estimated at 1,989 tpy in 1999, which represents approximately 27% of the total 7,641 tpy overall NO<sub>x</sub> point source emissions from the Lexington MSA. (See table 1-D)

Point source SO<sub>x</sub> emissions from Woodford County were estimated at 2,253 tons per year (tpy) in 1999, which represents approximately 18% of the total 12,210 tpy overall SO<sub>x</sub> point source emissions from the Lexington MSA. (See table 1-E)

Point source NH<sub>3</sub> emissions from Woodford County were estimated at 0 tpy in 1999. (See table 1-F)

Point source PM<sub>2.5</sub> emissions from Woodford County were estimated at 62 tons per year (tpy) in 1999, which represents approximately 11% of the total 582 tpy overall PM<sub>2.5</sub> point source emissions from the Lexington MSA. (See table 1- G)

### 1999 NEI Lexington Area Point Source Emissions (tons per year)



Point sources located within Woodford County are subject to PSD requirements, CTG RACT requirements, Maximum Achievable Control Technology (MACT) requirements for sources of Hazardous Air Pollutants, and New Source Performance Standards (NSPS).

### Onroad Mobile

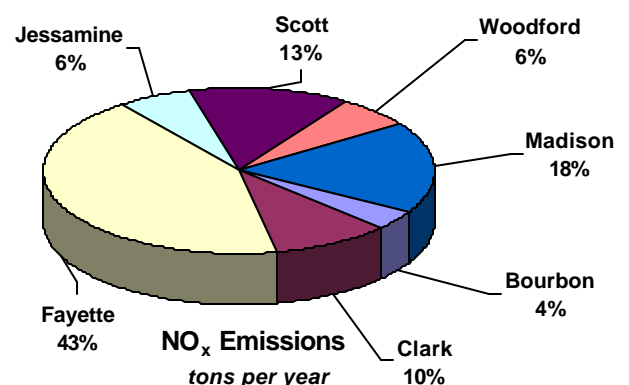
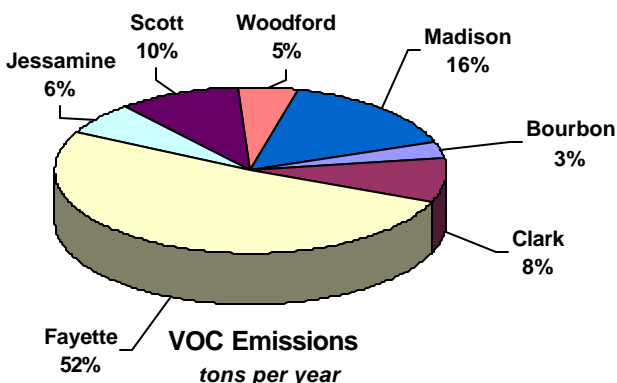
Onroad mobile source VOC emissions from Woodford County were estimated at 630 tons per year (tpy) in 1999, which represents approximately 5% of the total 12,736 tpy of overall VOC onroad mobile source emissions from the Lexington MSA. Onroad mobile source NO<sub>x</sub> emissions from Woodford County were estimated at 1,141 tpy in 1999, which represents approximately 6% of the total 18,194 tpy of overall NO<sub>x</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-D)

Onroad mobile source SO<sub>x</sub> emissions from Woodford County were estimated at 40 tons per year (tpy) in 1999, which represents approximately 6% of the total 675 tpy overall SO<sub>x</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-E)

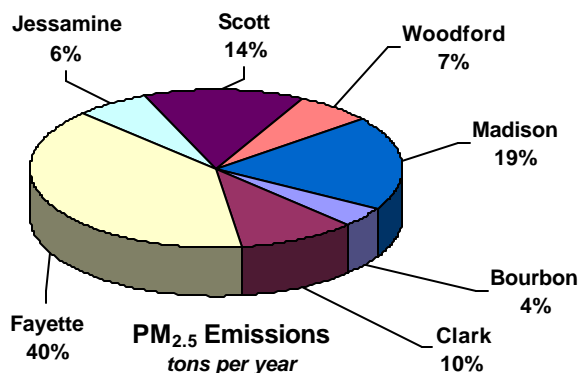
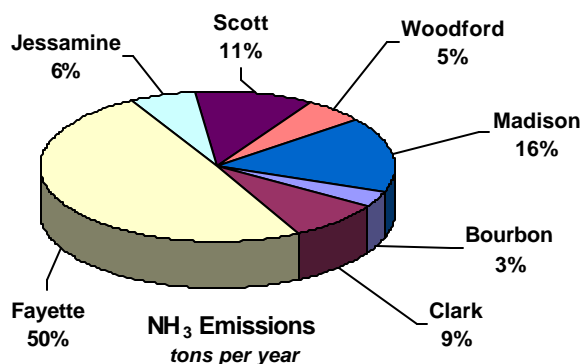
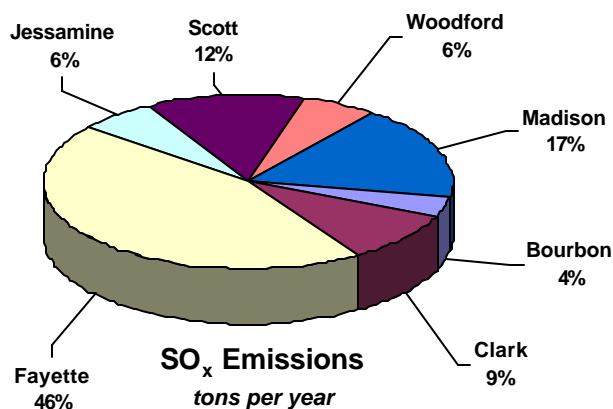
Onroad mobile source NH<sub>3</sub> emissions from Woodford County were estimated at 30 tpy in 1999, which represents approximately 5% of the total 564 tpy overall NH<sub>3</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-F)

Onroad mobile source PM<sub>2.5</sub> emissions from Woodford County were estimated at 26 tons per year (tpy) in 1999, which represents approximately 7% of the total 388 tpy overall PM<sub>2.5</sub> onroad mobile source emissions from the Lexington MSA. (See table 1-G)

### 1999 NEI Lexington MSA Onroad Mobile Source Emissions (tons per year)



# **1999 NEI Lexington MSA Onroad Mobile Source Emissions (continued)**



Based on information received from the Kentucky Transportation Cabinet, commuting traffic from other counties into Woodford County is 48.7% and classified as high, and the commuting traffic from Woodford County into other counties is significant at 54.8%.

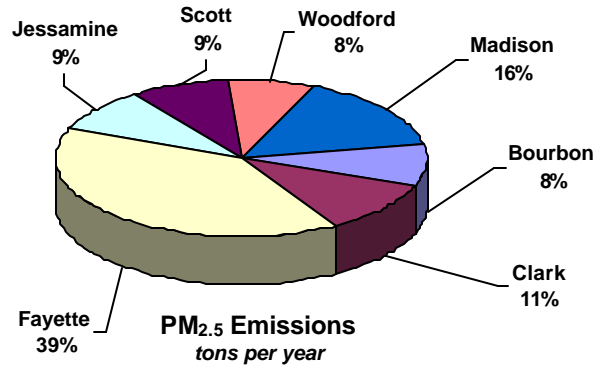
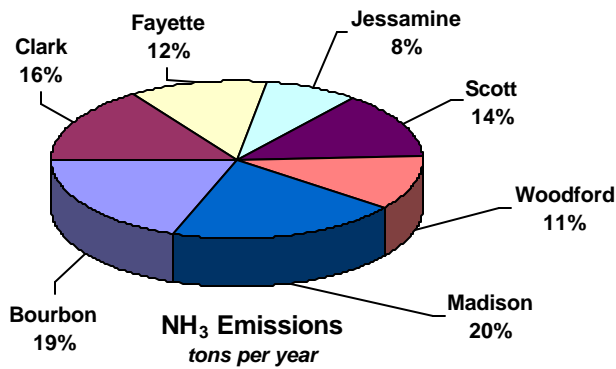
Commuting Classifications	
Not Significant	0-10%
Minimal	11-30%
High	31-50%
Significant	51% or more

## Area Sources

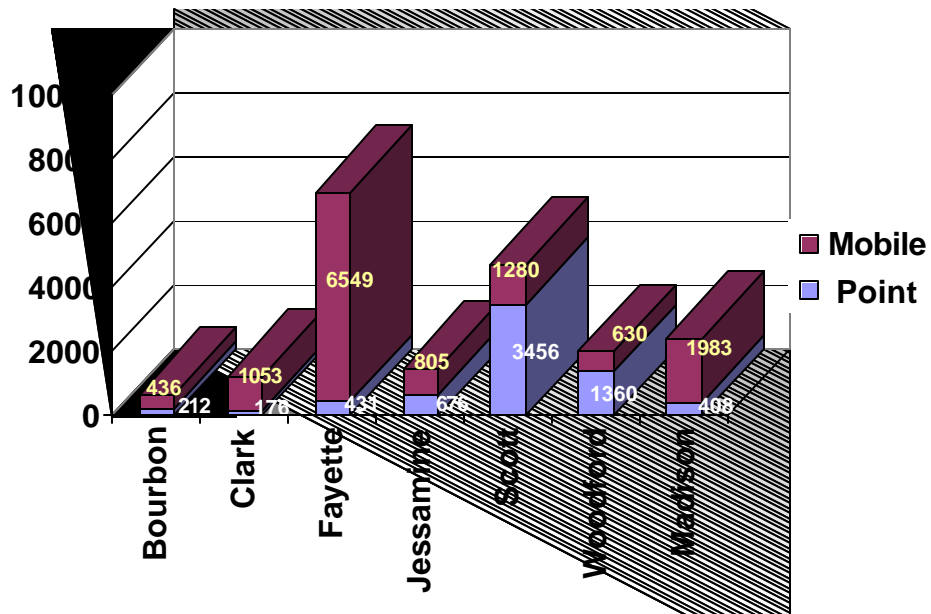
Area source  $\text{NH}_3$  emissions from Woodford County were estimated at 885 tpy in 1999, which represents approximately 11% of the total 8,281 tpy of overall  $\text{NH}_3$  area source emissions from the Lexington MSA. (See table 1-F)

Area source  $\text{PM}_{2.5}$  emissions from Woodford County were estimated at 461 tpy in 1999, which represents approximately 8% of the total 6,009 tpy of overall  $\text{PM}_{2.5}$  area source emissions from the Lexington MSA. (See table 1-G)

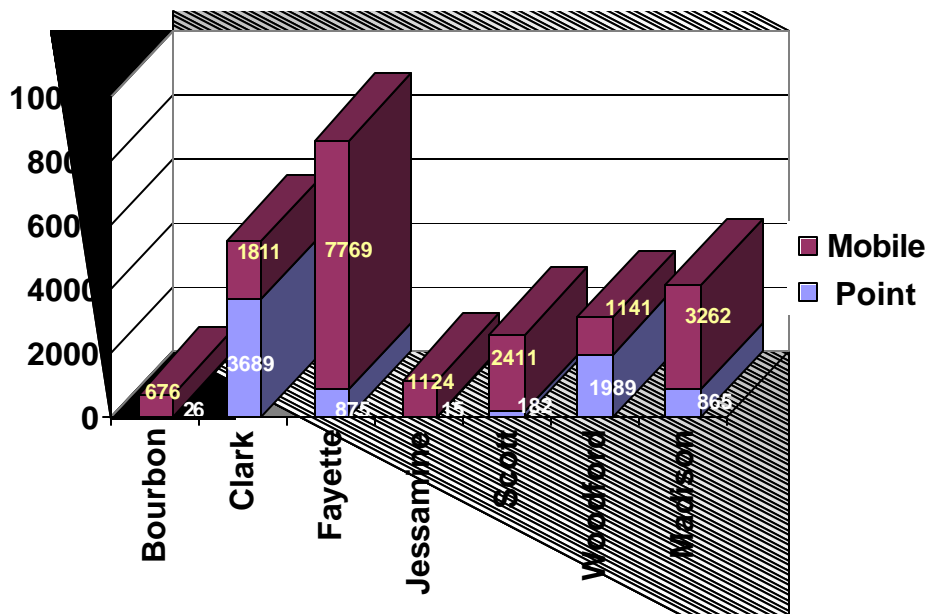
### 1999 NEI Lexington MSA Area Source Emissions (tons per year)



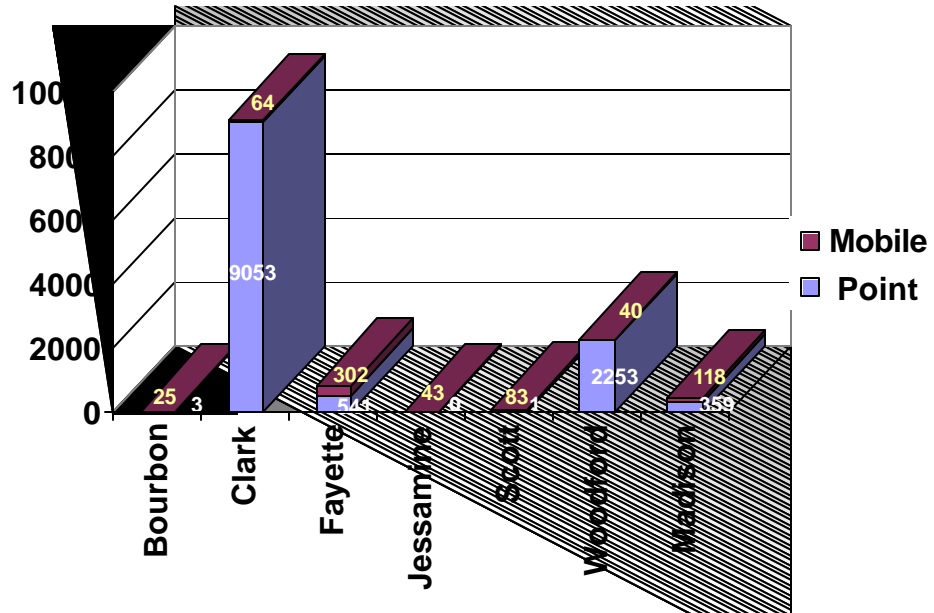
# 1999 NEI VOC Contribution (tons per year)



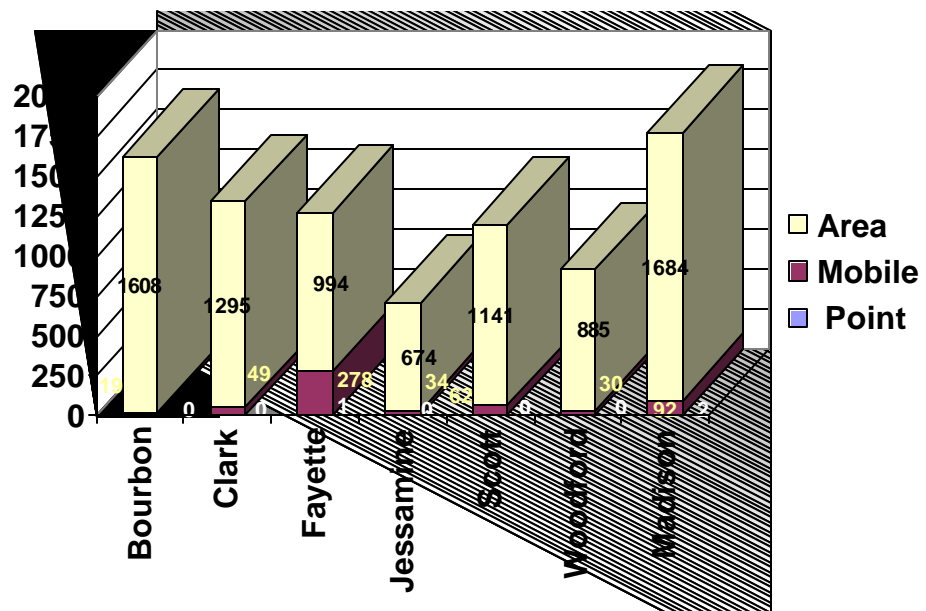
# 1999 NEI NO<sub>x</sub> Contribution (tons per year)



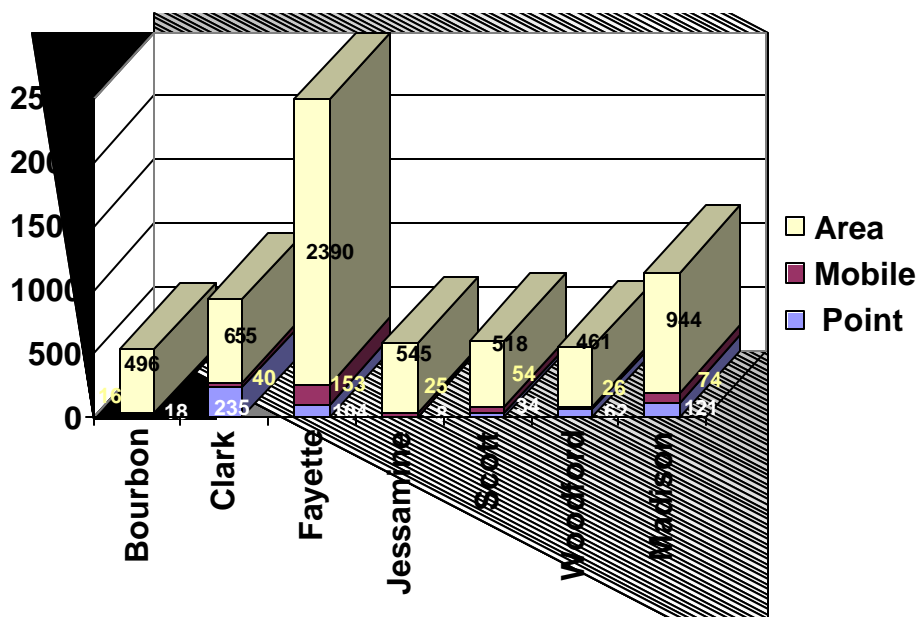
**1999 NEI SO<sub>x</sub>  
Contribution  
(tons per year)**



**1999 NEI NH<sub>3</sub>  
Contribution  
(tons per year)**



## 1999 NEI PM<sub>2.5</sub> Contribution (tons per year)



### Conclusion and Recommendation

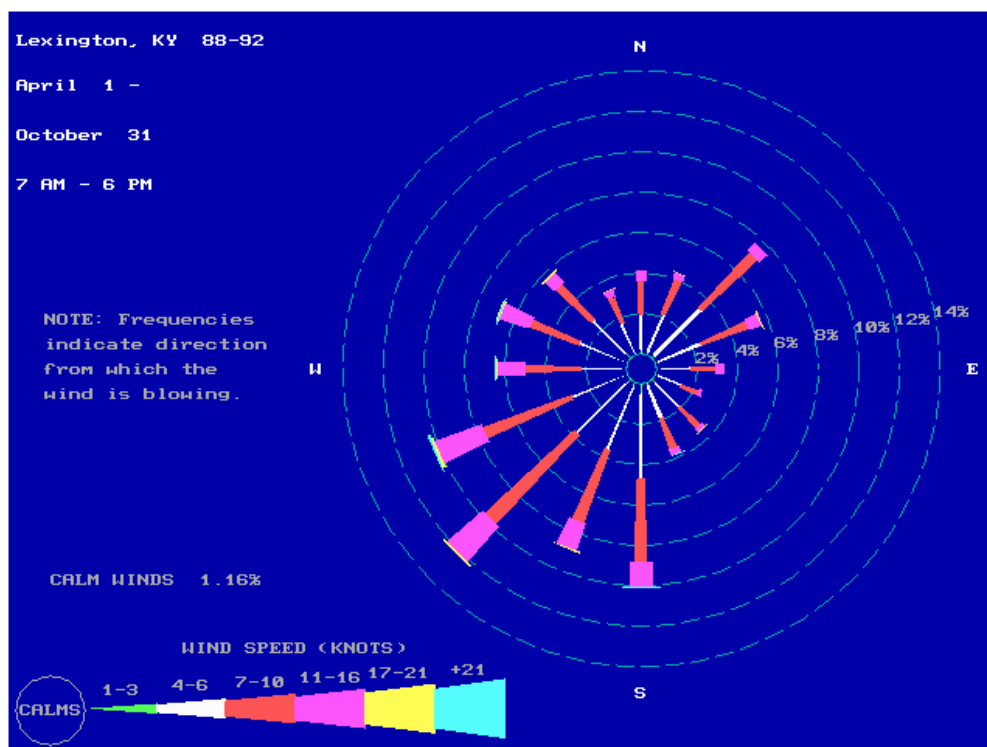
The emissions data and other documentation presented indicate that Woodford County, Kentucky, does not contribute a significant amount of PM<sub>2.5</sub> emissions nor emissions that contribute to PM<sub>2.5</sub> formation in the Lexington-Fayette MSA. Emission contributions from Woodford County are approximately 10% of the total VOC emissions, 12% of the total NO<sub>x</sub> emissions, 18% of the total SO<sub>x</sub> emissions, 8% of the total PM<sub>2.5</sub> emissions and 10% of the total NH<sub>3</sub> emissions in the Lexington-Fayette MSA.

Prevailing wind patterns would typically indicate that emissions from Woodford County are not impacting Fayette County, and if contributions were being seen, typically impacts would be at the Newtown monitor that is showing attainment of the standard rather than the Limestone monitoring site that is showing a violation.

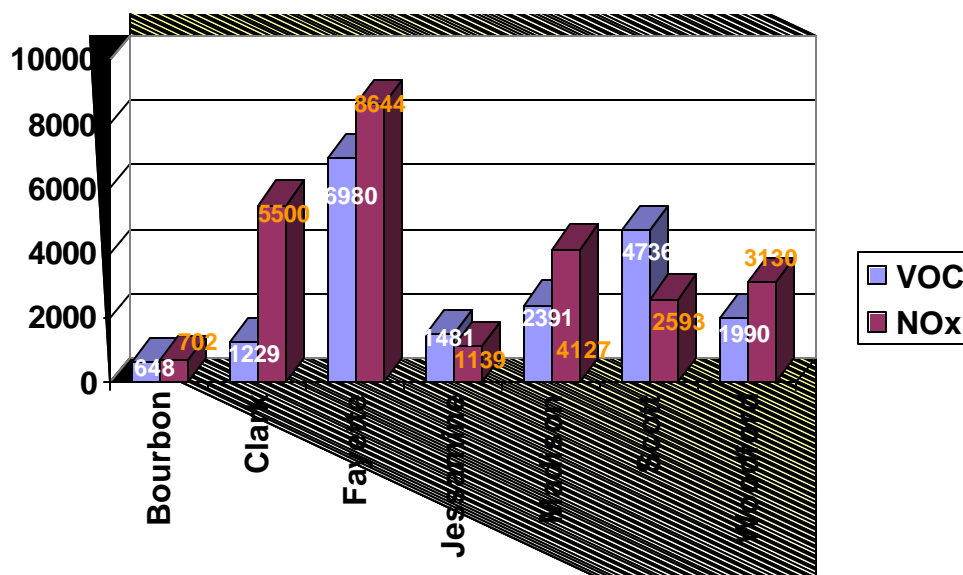
Therefore, Woodford County should be designated attainment for the PM<sub>2.5</sub> standard.



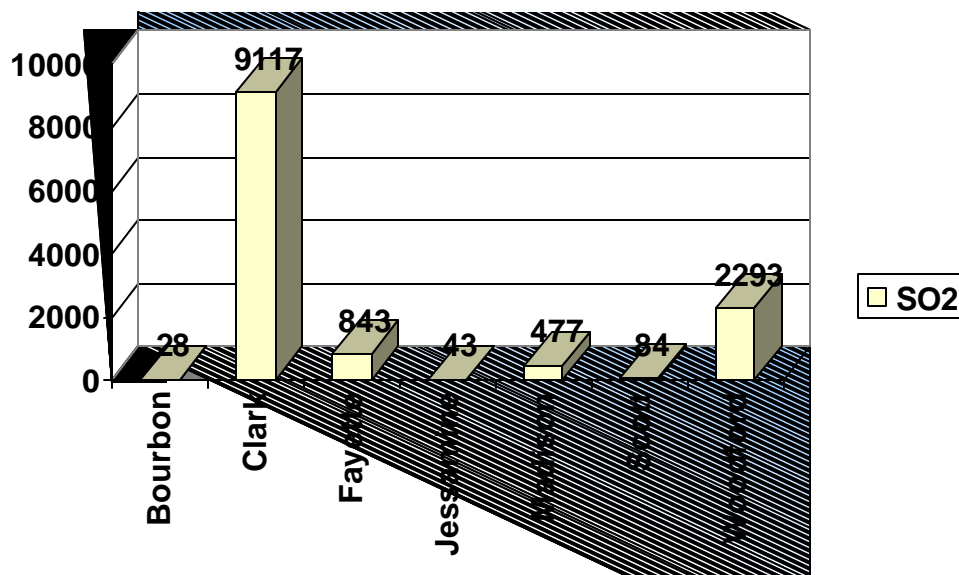
### Figure 1-A Wind Rose Patterns



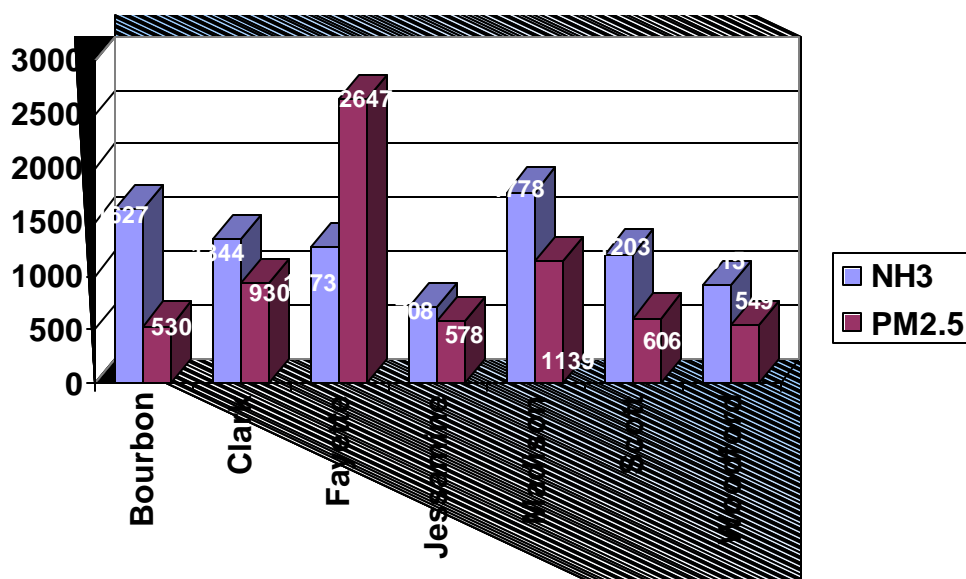
**Figure 1-B**  
**1999 NEI Lexington-Fayette MSA**  
**VOC and NO<sub>x</sub> Emissions**  
*(tons per year)*



**Figure 1-C**  
**1999 NEI Lexington-Fayette MSA**  
**SO<sub>x</sub> Emissions**  
*(tons per year)*



**Figure 1-D**  
**1999 Lexington-Fayette MSA**  
**NH<sub>3</sub> and PM<sub>2.5</sub> Emissions**  
*(tons per year)*



**Table 1-A**  
**Annual Average Design Value for PM 2.5**  
(micrograms per cubic meter)

County	2001	2002	2003	Design Value
<b>Kentucky</b>				
Fayette – Limestone	16.2	15.6	15.0	15.6
Fayette – Newtown Pike	15.7	15.1	13.8	14.9
Bourbon				N/A
Clark				N/A
Jessamine				N/A
Madison	13.9	13.5	12.9	13.4
Scott				N/A
Woodford				N/A

**Table 1-B**  
**Lexington, KY MSA Population**  
**Growth Data**

County	1990	2000	%Growth 1990 - 2000	2010	%Growth 2000 - 2010
<b>Bourbon</b>	19,236	19,360	0.6%	19,350	-0.1%
<b>Clark</b>	29,496	33,144	12.4%	36,932	11.4%
<b>Fayette</b>	225,366	260,512	15.6%	295,664	13.5%
<b>Jessamine</b>	30,508	39,041	28.0%	48,116	23.2%
<b>Madison</b>	57,508	70,872	23.2%	83,629	18.0
<b>Scott</b>	23,867	33,061	38.5%	44,851	35.7%
<b>Woodford</b>	19,955	23,208	16.3%	26,427	13.9%

**Table 1-C**  
**2002 Estimated Lexington, KY MSA**  
**Population**

Kentucky	Estimated Population
Bourbon County	19,576
Clark County	33,726
Fayette County	263,618
Jessamine County	40,740
Madison County	73,334
Scott County	35,320
Woodford County	23,403
<b>Total MSA Estimated Population</b>	<b>489,717</b>

**Table 1-D**  
**1999 NEI Lexington-Fayette County, KY MSA**  
**VOC and NO<sub>x</sub> Emissions**  
*(tons per year)*

County	VOC			NO <sub>x</sub>		
	Point	Mobile	Total	Point	Mobile	Total
Bourbon	212	436	648	26	676	702
Clark	176	1,053	1,229	3,689	1,811	5,500
Fayette	431	6,549	6,980	875	7,769	8,644
Jessamine	676	805	1,481	15	1,124	1,139
Madison	408	1,983	2,391	865	3,262	4,127
Scott	3,456	1,280	4,736	182	2,411	2,593
Woodford	1,360	630	1,990	1,989	1,141	3,130
<b>Total Emissions</b>	<b>6,719</b>	<b>12,736</b>	<b>19,455</b>	<b>7,641</b>	<b>18,194</b>	<b>25,835</b>

**Table 1-E**  
**1999 NEI Lexington-Fayette County, KY MSA**  
**SO<sub>x</sub> Emissions**  
*(tons per year)*

County	SO <sub>x</sub>		
	Point	Mobile	Total
Bourbon	3	25	28
Clark	9,053	64	9,117
Fayette	541	302	843
Jessamine	0	43	43
Madison	359	118	477
Scott	1	83	84
Woodford	2,253	40	2,293
Total Emissions	12,210	675	12,885

**Table 1-F**  
**1999 NEI Lexington-Fayette County, KY MSA**  
**NH<sub>3</sub> Emissions**  
*(tons per year)*

County	NH <sub>3</sub>			
	Area	Point	Mobile	Total
Bourbon	1,608	0	19	1,627
Clark	1,295	0	49	1,344
Fayette	994	1	278	1,273
Jessamine	674	0	34	708
Madison	1,684	2	92	1,778
Scott	1,141	0	62	1,203
Woodford	885	0	30	915
Total Emissions	8,281	3	564	8,848

**Table 1-G**  
**1999 NEI Lexington-Fayette County, KY MSA**  
**PM<sub>2.5</sub> Emissions**  
*(tons per year)*

County	PM <sub>2.5</sub>			Total
	Area	Point	Mobile	
Bourbon	496	18	16	530
Clark	655	235	40	930
Fayette	2,390	104	153	2,647
Jessamine	545	8	25	578
Madison	944	121	74	1,139
Scott	518	34	54	606
Woodford	461	62	26	549
Total Emissions	6,009	582	388	6,979